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STUDIES ON NORTH AMERICAN PHILOTES (LYCAENIDAE)

V. TAXONOMIC AND BIOLOGICAL NOTES, CONTINUED

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INTRODUCTION

This paper continues in the format established in Part IV (Shields, 1975) for the remainder of the named subspecies of Nearctic *Shijimiaeoides* (= *Philotes*) (except that *S. rita rita* and *S. rita coloradensis* will appear in a separate paper with Michael Fisher). Parts II-V are intended to be read as a set and not to be interpreted separately. One more paper in this series is in preparation, describing several new subspecies and reporting a unique collection of John Lane's from southern California. This project required six years to complete, as *Shijimiaeoides* ranks with *Colias*, *Euphydryas*, *Speyeria*, and *Agathymus* in taxonomic complexity. Apologies are extended to contributors for lengthy delays in returning some of their material, due to having all specimens before me for viewing, rather than relying on comparisons drawn from memory. *Eriogonum* distributions follow Reveal (1969b) for the most part.

NON-HOST ERIOGONUM

Certain *Eriogonum* species are not used by *Shijimiaeoides*. I have never seen *Shijimiaeoides* flying around *E. inflatum* Torr. & Frem. and *E. deflexum* Torr. & Ives, two species commonly encountered on field trips, nor around *E. elatum* Dougl. ex Benth. or *E. cernuum* Nutt. None were seen on blooms of *E. fendleri-anum* (Benth. in DC.) Small near Vermejo River, Hwy. 64; and 7 mi. S. Raton; both in Colfax Co., New Mexico (VIII-16-70). A visit to the type locality of *E. apachense* Reveal near Bylas, Arizona (see Reveal, 1969a) on 30 Aug. 1970 produced negative results. None were seen around the blooms of *E. pelinophilum* Reveal at 8.6 mi. W. of Hotchkiss, Delta Co., Colorado (see Reveal, 1973). No *Shijimiaeoides* were found on the blooms of *E. hieracifolium* Benth. in DC. along Hwy. 73 from near Indian

Pine to Carrizo, Navajo & Gila Cos., Arizona, VII-27-70 (*Shields* #124). *Eriogonum abertianum* Torr. in Emory var. *abertianum* grows commonly near Ramsey Canyon, Cochise Co., Arizona, VII-28-70 (*Shields* #126) and 13-14 mi. NE of Lordsburg, Hidalgo Co., New Mexico, VIII-25-70 (*Shields* #156) but is not a host of *S. rita rita* at these locations.

BEHAVIOUR NOTES

At 6 rd. mi. S. Sherwin Summit, along Hwy. 395, Mono Co., V-18-70, *S. enoptes langstoni* flew commonly around the white-flowered *Eriogonum kennedyi* var. *purpusii* (one oviposition observed), while *S. battooides* nr. *glaucum* avoided this species and alighted on the scarcer yellow-flowered *E. umbellatum* var. *chlorothamnus*, in a mixed stand of the two.

At the canyon 3/4 mi. SSE Horse Thief Spgs., Kingston Range, San Bernardino Co., IX-15-70, a fresh male *S. enoptes dammersi* investigated a male of the white skipper *Helioptetes ericetorum* that was perched with outstretched wings on the mud. It tried to alight on the skipper ("hovering" over it as if it were a flower) then flew off after this brief encounter. Perhaps significantly, *dammersi* was associated with the white-flowered *Eriogonum wrightii* var. *wrightii* in this canyon.

Shijimiaeoides rita pallescens (Tilden & Downey, 1955)

Tilden & Downey. 1955. *Bull. S. Calif. Acad. Sci.* 1955, vol. 54, pp. 25-29, pl. 11, ff. 1 & 3, pl. 12, ff. 4-6.

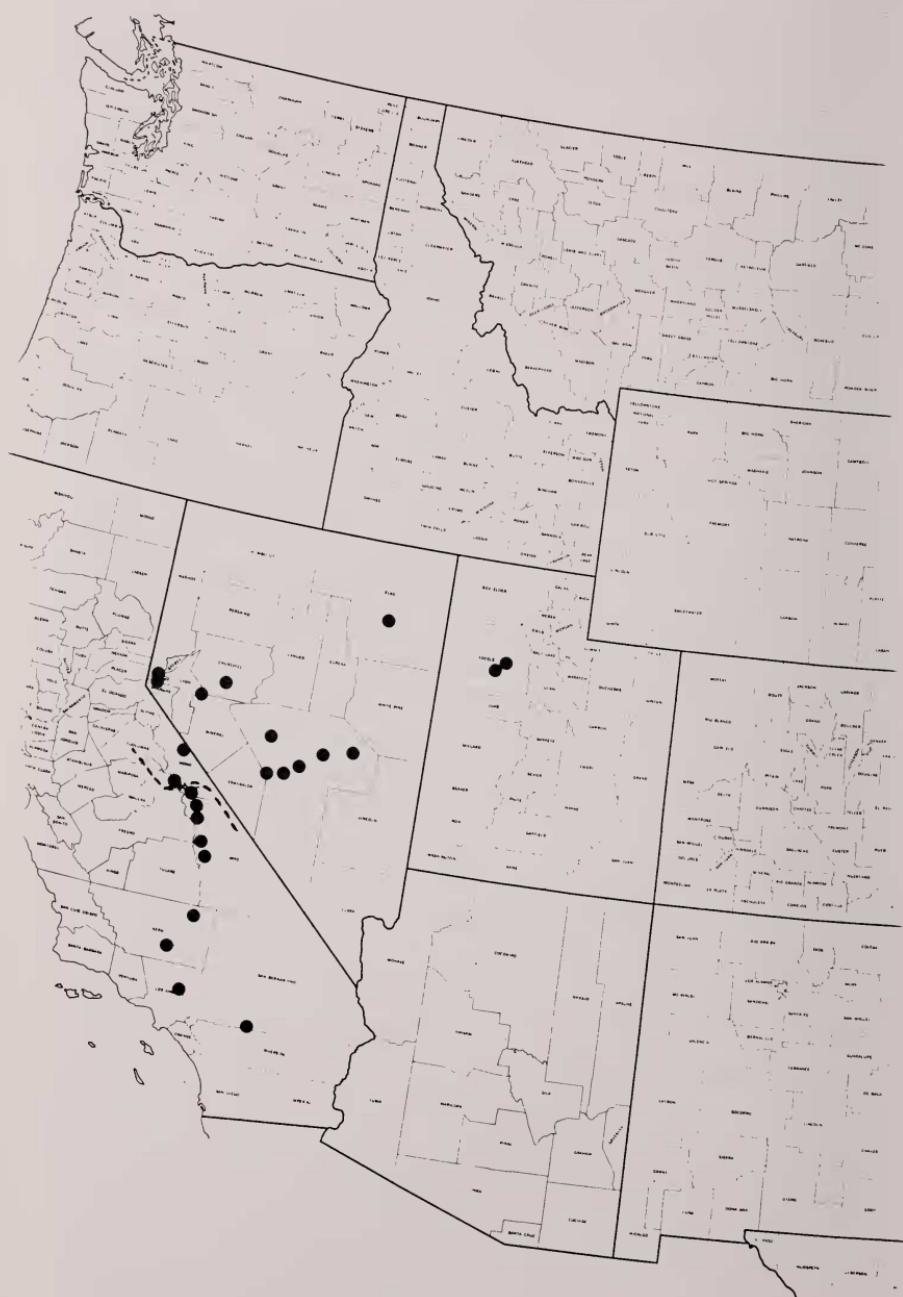
This was originally described as a separate species, but Mattoni (1965, p. 94) noted that in the shape of the valve it is similar to *elvira* and thus considered *pallescens* to be a subspecies of *rita*. There is little doubt that Mattoni's decision is correct, as *S. rita pallescens* intergrades with *rita elvira* in extreme western Nevada and eastern California and displays affinities to *rita emmeli* in western Utah. The holotype male comes from Little Granite Mountain, Dugway Proving Grounds, Tooele Co., Utah, VIII-20-53 (H. E. Cott). The paratype series was taken at this locality, at Dog Area in Dugway Proving Ground, and in the Stansbury Mountains. Tilden & Downey adequately describe *pallescens* and picture the adults and male valve (in comparison with *rita rita*). Previously known from only the type locality, *pallescens* ranges across northern Nevada in scattered locations.

Number of teeth on terminal end (cucullus) of valve = 11

(1), 12 (1), 14 (5), 15 (4), 16 (1), 17 (5), 18 (4), 19 (7), 20 (4), 21 (7), 22 (1), 24 (1); N = 41, average = 17-19, from Sand Mtn., Currant, and Ralston Valley, Nevada.

DISTRIBUTION (viewed 62♂ gen. from 10 localities): CALIFORNIA: Mono Co.: Mammoth, 1♀, vii (CAS). NEVADA: Lyon-Mineral Co. line: U.S. 95, Co. line, 5♂ 7♀, ix (AM). Nye Co.: Jett Canyon, Toiyabe Range, 1♂, viii (AM). County undetermined: Montello Wells, 1♂, viii (CM). UTAH: Tooele Co.: NW Willow Springs, Stansbury Mts., 17♂ 23♀, viii (AM).

HOSTS AND DISTRIBUTION: *Eriogonum kearneyi* Tidestr. var. *kearneyi*. CALIFORNIA: Mono Co.: ca. 5-6 rd. mi. WSW Calif.-Nevada border along Cal. State Hwy. 167, 6700', T3N, R28E, 10♂ 11♀, vii (AM), adult assoc. (*Shields* #7). NEVADA: Churchill Co.: SE base of Sand Mtn., 4000', T17N, R32E, ca. 7 air mi. WNW Frenchman, 78♂ 47♀, vii-ix (AM), oviposition (*Shields* #5 & #244). Nye Co.: NW corner T9N, R58E, sand flats, 7 rd. mi. S Currant, 5000', on dirt rd. to Nyala, Railroad Valley, 48♂ 60♀, vii, viii (AM), oviposition & larvae reared to adult (*Shields* #3); 7 air mi. NW Lunar Crater (1/2 rd. mi. E Sandy Summit), on US Hwy. 6, 6000', T7N, R52E, E of Hot Creek Range, 2♀, viii (AM), adult assoc. (*Shields* #11); Ralston Valley, 5600', from jct. Hwy. 8A & US Hwy. 6 to 1½ mi. W. of this jct., E of Tonopah, T3N, R43E, 17♂ 14♀, vii (AM), oviposition (*Shields* #4); 6 rd. mi. W of Warm Springs on US Hwy. 6, 6200', E side Stone Cabin Valley & S end of Hot Creek Range, T4N, R49E, 1♂ 2♀, viii (AM), adult assoc. (*Shields* #12). UTAH: Tooele Co.: sand hills, 3 rd. mi. SW Johnsons Pass, 5200', E side Skull Valley, T6S, R7W, 36♂ 32♀, viii (AM), adult assoc. (*Shields* #14). *Eriogonum microthecum* Nutt. var. *foliosum* (Torr.) Reveal. NEVADA: Nye Co.: 5 rd. mi. W of Five Mile Spring on US Hwy. 6, 6400', at S end Monitor Range, NW 1/4 of T3N, R47E, 3♂ 3♀, viii (AM), adult assoc. (*Shields* #13). *Eriogonum baileyi* S. Wats. var. *baileyi*. NEVADA: Washoe Co.: 3 rd. mi. SSE of US Hwy. 395 on Nevada Hwy. 3B, SE of Little Washoe Lake, 5100', T17N, R20E, 5♂ 14♀, vii (AM), oviposition (*Shields* #8). *Eriogonum baileyi* S. Wats. var. *divaricatum* (Gandg.) Reveal. NEVADA: Ormsby Co.: 1 mi. S Carson City, 4900', at base of E slope of Carson Range, 2♂ 3♀, vii (AM), adult assoc. (*Shields* #9). *Eriogonum heermannii* Dur. & Hilg. var. *humilius* (S. Stokes) Reveal. NEVADA: Washoe Co.: 11 rd. mi. NW of Nixon, W shore Pyramid Lake, 3900', 1♂, viii (AM), adult assoc. (*Shields* #245). See Map 1.



Map 1.—Distribution of *Shijimiaeoides rita pallescens* (above dotted line) and *S. r. elvirae* (below).

Ssp. *pallescens* is in flight from early July to September.

One pair in a series of 17 males, 23 female *pallescens* from Willow Springs, Tooele Co., Utah, are like *emmeli*.

One male from 5-6 mi. WSW Calif.-Nev. border along Hwy. 167, Mono Co., California, is unusual in that the aurora is almost absent. Populations on *E. baileyi* in Washoe Co., Nevada, are small and atypical.

Near Currant, Nye Co., Nevada, *pallescens* is at least double-brooded, as larvae collected on 2 Aug. 1969 emerged prior to 30 Aug. 1969 (fresh adults were on wing 6 July 1969 and 2 Aug. 1969).

Eriogonum kearneyi var. *kearneyi* grows in sandy soils from extreme east-central California eastward across central and southern Nevada to western Utah and northwestern Arizona, flowering from July to September. *E. microthecum* var. *foliosum* is widespread and common from southeastern California in eastern San Bernardino and Inyo Cos. eastward across southern and central Nevada into northern Arizona and southern Utah, northward on the Colorado Plateau to Emery and Grand Cos., and in widely scattered locations as far north as the Wyoming state line, entering western Colorado in Mesa Co. and proceeding southward and across southern Colorado to San Luis Valley and across northern New Mexico to the Sangre de Cristo Mts., hence southward to central New Mexico, 4500-7500', flowering from June to October. *E. baileyi* var. *baileyi* occurs in southern and eastern California and western Nevada northward to southeastern Washington and southwestern Idaho, flowering from May to September. Var. *divaricatum* grows in Placer and Nevada Cos., California and from Washoe to Douglas Cos., Nevada, flowering from June to September.

Shijimiaeoides rita elvira (Mattoni, 1965)

Mattoni. 1965 [1966]. *Jour. Research Lepid.* 1965, vol. 4; pp. 94-99, 84-85 (tables), 96 (map), 99 (type distr.); f. 5, nos. r-w; f. 1, col. 4 (4 ff.); f. 7, rows 3-4 (9 ff.).

The holotype male comes from 3.5 miles southwest of Pearblossom, Los Angeles Co., California, VIII-20-64. Mattoni's detailed verbal description, with black-and-white photographs of a series of adults and male and female genitalia, and a comparison with the other named *rita* subspecies, makes repetition here unnecessary. He recorded the foodplant as *Eriogonum plumatella* and included distributional records. Comstock & Henne (1967) gave a detailed life-history description of *elvira*,

with a black-and-white painting of the egg, mature larva, and pupa. They noted that the larvae "did not take normally to our coastal *E. fasciculatum*."

Number of teeth on terminal end (cucullus) of valve = 13 (2), 14 (2), 16 (2), 17 (1), 18 (1), 19 (2); N = 10, average = 16, from Pearblossom mostly, and two other localities.

DISTRIBUTION (viewed 13♂ gen. from 3 different localities): CALIFORNIA: Inyo Co.: Big Pine Creek, 6000', 4♂ 7♀, viii (KH, PO, CIS); above Bishop, 1♂, vii (LACM); 9 mi. W Lone Pine, 7♂ 5♀, ix (CIS). Kern Co.: Tehachapi, 1♀, viii (LACM); Walker Pass, 5250', 1♀, vi (DB); 1 mi. W Walker Pass, 1♂, ix (CIS). Los Angeles Co.: wash-N boundary Juniper Hills, Mojave Desert, 3400', 11♂ 11♀, vii-ix (AM, KH, KR, LACM); Juniper Hills, 3400', 2 mi. S Pearblossom, 10♂ 24♀, vii, ix (CIS, LACM, KR); Juniper Hills nr. Pearblossom, 7♂ 13♀, viii, ix (JL, PO); Pearblossom, 4♂ 5♀, viii (GG). Mono Co.: Sherwin Summit (old 395), 5♂ 2♀, ix (CIS).

HOSTS: *Eriogonum plumatella* Dur. & Hilg. var. *jaegeri* (Munz & Johnst.) Stokes ex Munz. CALIFORNIA: San Bernardino Co.: 1 mi. E Morongo Valley, 2♂, ix (AM), adult assoc. (Shields #58). *Eriogonum plumatella* Dur. & Hilg. var. *plumatella*. CALIFORNIA: Los Angeles Co.: Juniper Hills, 3500', 3 mi. SW Pearblossom, 3♂ 7♀, ix (AM), adult assoc. & larvae reared (Shields #64). *Eriogonum microthecum* Nutt. var. *ambiguum* (M. E. Jones) Reveal in Munz. CALIFORNIA: Inyo Co.: Onion Valley Rd., nr. Tub Sprgs., W of Independence, 4♂ 6♀, viii (LACM, SE), adult assoc. (J. F. Emmel #113 & Shields #128). *Eriogonum kearneyi* Tidestr. var. *monoense* (S. Stokes) Reveal. CALIFORNIA: Mono Co.: Sherwin Summit, Old Hwy. 395, ix, adult assoc. (J. A. Powell, pers. comm., identified at UCB Herbarium). See Map 1.

Ssp. *elvirae* flies from mid June to late September.

There appears to be some gene flow between *pallescens* and *elvirae* based on undersurface characters. Populations from Walker Pass, Kern Co.; Big Pine Creek, Bishop, and Lone Pine, Inyo Co.; and Sherwin Summit, Mono Co., in California; and at Little Washoe Lake, Carson City, and the Lyon-Mineral Co. line on U.S. 95, in Nevada, display a mixed series, some being similar to *elvirae*, others closer to *pallescens*.

Ssp. *elvirae* from Juniper Hills, Los Angeles Co., often resemble the small form of *battoides ellisii* from the eastern Mojave Desert on the underside. At Walker Pass, Kern Co., *elvirae* is sympatric with *battoides bernardino*, and at Sherwin Summit,

Mono Co., it is sympatric (but allochronic) with *enoptes enoptes*.

Eriogonum plumatella var. *plumatella* occurs from southern California to Mohave Co., Arizona (and perhaps southwestern Utah), flowering from August to November. Var. *jaegeri* is confined to the Mojave Desert, California and Mohave Co., Arizona. On 11 Sept. 1969, J. F. Emmel and I inspected *E. plumatella* in full bloom at a wash along Kelbaker Rd., S. of Granite Mts., SW of Providence Mts.; near Colton Well, 3100', S. end of Colton Hills; and near Weaver's Well, Old Woman Mts.; all in San Bernardino Co., California, without finding any *elvirae* adults. Nor did I find *elvirae* in September on *E. plumatella* near Scissors Crossing, San Diego Co., California, which supports a large colony of *Apodemia mormo deserti*.

Eriogonum microthecum var. *ambiguum* is found in dry rocky places from southern Washoe Co., Nevada and adjacent Nevada Co., California, southward along the eastern flank of the Sierra Nevada and adjacent desert ranges to Mineral and Esmeralda cos., Nevada, and Mono and Inyo cos., California, 6500-10,500', flowering from July to September. *Eriogonum kearneyi* var. *monoense* grows on gravelly soils along the eastern flank of the Sierra Nevada from extreme southern Mono Co. into Inyo Co., California (endemic), flowering from July to October.

Shijimiaeoides enoptes dammersi (Comstock & Henne, 1933)

Comstock, J. A., & Henne. 1933. *Bull. S. Calif. Acad. Sci.* 1933, vol. 32, pp. 23-26.

The holotype male was taken at Snow Creek, Riverside Co., California, IX-9-32 (C. Henne). Some 70 paratypes were distributed along USNM, Canadian Museum, LACM, and CAS, collected at Snow Creek (mostly) and Chino Canyon, both located at the base of the San Jacinto Mts. near Palm Springs. The type description leaves no doubt as to the identity of this fall, desert subspecies of *enoptes* from southeastern California, extreme southern Nevada, and northwestern Arizona. The only subspecies that could be confused with *dammersi* is *rita rita*, which is very similar in appearance but is readily separable upon examination of the male genitalia (*rita* has cristae which *enoptes* lacks). Ssp. *rita rita* flies in central and southeastern Arizona, southwestern New Mexico, and extreme western Texas. Foster H. Benjamin examined the male genitalia of *dammersi* for Comstock and Henne and stated that "it is allied to *enoptes*." (I have examined the large series of paratypes in the LACM

collection.) The subspecies is accurately pictured in Emmel & Emmel (1973, pl. 8, figs. 10-12). A description and figures of the egg, larvae, and pupa appear in Comstock & Henne (1965), and the mature larva and pupa are illustrated in Emmel & Emmel (1973, fig. 56).

Number of teeth on terminal end (cucullus) of valve = 10 (1), 11 (2), 12 (7), 13 (9), 14 (11), 15 (3), 16 (3), 17 (3), 18 (2); N = 41, average 13-14, from Banning, Granite Mts., and jct. 79 & 179 mostly, plus two other localities.

DISTRIBUTION (viewed 78♂ gen. from 21 localities): ARIZONA: *Gila Co.*: East Verde River, 10 mi. N Payson, 1♀, ix (UCD); Tonto Bridge, 4900', 72 mi. NE of Phoenix, 1♀, ix (AM). *Maricopa Co.*: 1 mi. N Sunflower, 7♂, ix (KR). *Mohave Co.*: Hualapai Mts., 6♂ 3♀, ix (LACM, KH). *Yavapai Co.*: Black Hills, 4♂ 1♀, ix (DB); Hillside, 3♂ 3♀, ix (DB); 1 mi. S Hillside, 1♂, ix (JS); nr. Jerome, 3♂, ix (DB); Mingus Mtn., 5500', 6♂ 1♀, ix (DB, CIS); Sycamore Creek, 3500', 1♂, x (DB); nr. Verde Hot Spr., 4♂ 5♀, ix (DB). CALIFORNIA: *Riverside Co.*: Chino Canyon nr. Palm Springs, 3♂, ix, x (AM, LACM); Palm Springs, 1♂, x (LACM); Snow Creek, nr. Palm Springs, 13♂ 13♀, ix, x (LACM, GG, JL, YU, CAS); Whitewater, 10♂ 7♀, ix, x (LACM, CAS); Whitewater Canyon, 7♂ 5♀, ix, x (UCD, LACM, AM). *San Bernardino Co.*: nr. Barnwell, 1♂ 1♀, ix (CIS); Cedar Cyn., Mid Hills, New York Mts., 5♂ 6♀, ix (KH); 5 mi. NW of Cima, 4900', 4♀, ix (MCZ); Kingston Range, 6400', 1♀, ix (LACM); Mtn. Pass Sta., Ivanpah Mtns., 1♀, ix (CIS); New York Mts., 13♂ 10♀, ix (KH, LACM); Tecopa Pass, 3/4 mi. S of, 4900', 1♂, ix (AM). *San Diego Co.*: nr. Camp Ole, Laguna Mts., 4♂, viii (CIS); Laguna Grade, 5000', Laguna Mts., 1♀, ix (AM); Hwy. 79 nr. Lake Henshaw, 5♂ 4♀, viii, ix (KH); Lake Henshaw, Hwy. 79, 4♂ 1♀, ix (CIS, PO); 2 mi. E Lake Henshaw, 2♀, ix (LACM); 2 mi. W Manzanita, 4♀, x (CIS); Mason Valley, Box Canyon, 1♀, x (LACM); Sentenac Canyon, 1♂, ix (CM); nr. Warner's Hot Spgs., 1♂ 1♀, ix (LACM). NEVADA: *Lincoln Co.*: Meadow Valley Wash, 4200-4400', 8 rd. mi. S turnoff from Caliente, T5S, R66E, 1♂, ix (AM).

HOSTS AND DISTRIBUTION: *Eriogonum wrightii* Torr. ex Benth. in DC. var. *wrightii*. ARIZONA: *Mohave Co.*: 1.0 to 1.2 road mi. NW of Hualapai Mountain Park, Hualapai Mts., 3♀, ix (AM), adult assoc. (*Shields #180*). *Yavapai Co.*: 4 rd. mi. E of Cherry, 2♂ 1♀, ix (AM), adult assoc. (*Shields #53*); 3 rd. mi. NE of jct. Hwy. 79 & 179, along Hwy. 79, 11♂ 7♀, ix

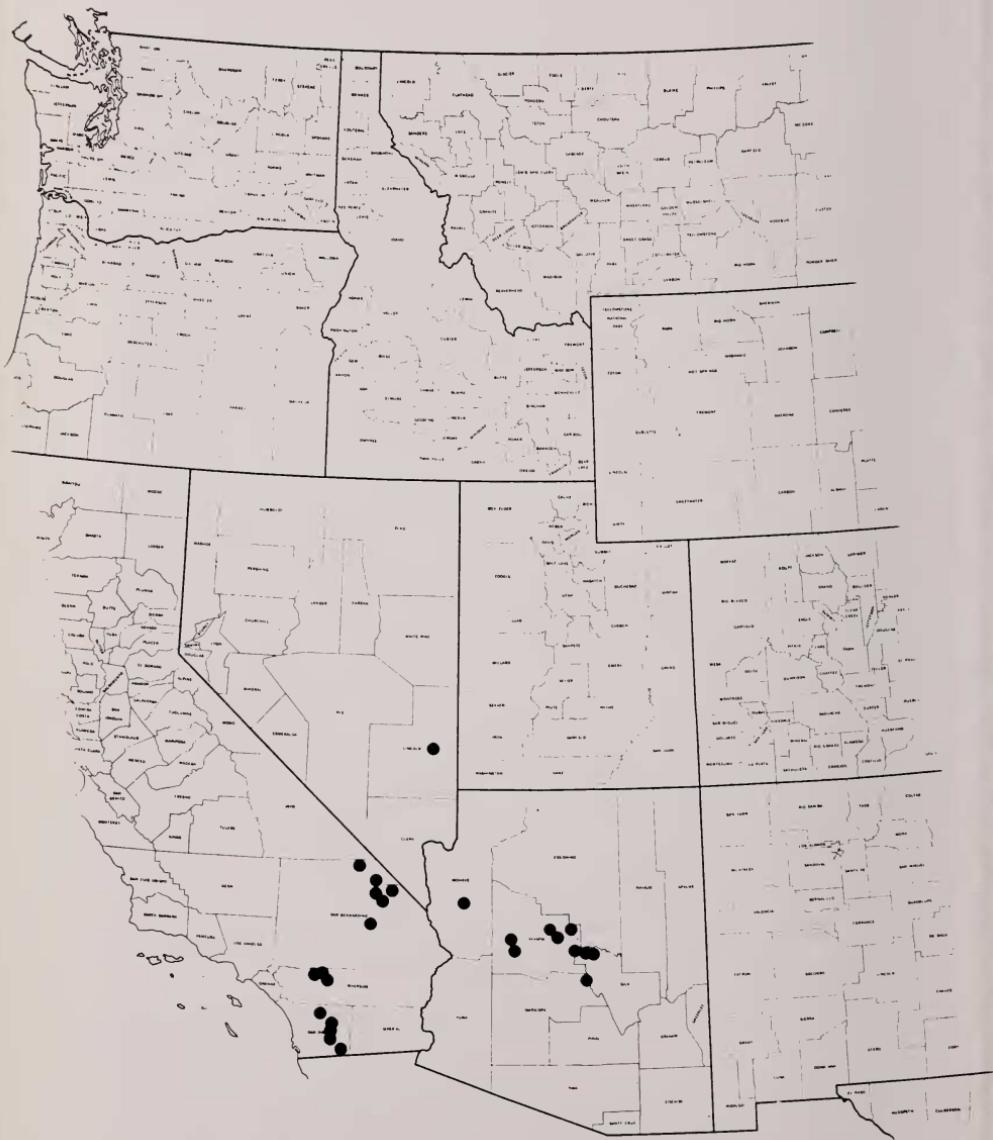
(AM), adult assoc. (*Shields* #52). CALIFORNIA: *San Bernardino Co.*: large canyon just SE of Clark Mtn. (Peak), ca. 5600-6000', 5 rd. mi. NW of Mountain Pass, 1♀, ix (AM), adult assoc. (*Shields* #177); vicinity of Cove Spring, 4100', T8N, R13E, sec. 8 (SE 1/4) & 17 (NE 1/4), Granite Mts., just SW of Providence Mts., 29♂ 8♀, ix (AM), adult assoc. (*Shields* #59); canyon 3/4 air mi. SSE of Horse Thief Springs, Kingston Range, 6♂ 2♀, ix (AM), oviposition (*Shields* #176); Mid Hills, 5100', NW exposure of ridge, T13N, R15E, NE 1/4 of sec. 31, along road, 8♂ 20♀, ix (AM), adult assoc. (*Shields* #60). *Eriogonum wrightii* Torr. ex Benth. in DC. var. *membranaceum* Stokes ex Jeps. CALIFORNIA: *San Diego Co.*: Power Station, S of Warner's Hot Spgs. at turnoff to Borrego. 1♂, ix (AM), adult assoc. (*Shields* #183). *Eriogonum elongatum* Benth. var. *elongatum*. CALIFORNIA: *Riverside Co.*: 1½ mi. S Banning, 2300', along Hwy. R1, T3S, R1E, sec. 15 (S center of), 42♂ 25♀, ix (AM), adult assoc. (*Shields* #57). See Map 2.

Ssp. *dammersi* is on the wing from late August to late October.

At Snow Creek, Riverside Co., one female *enoptes dammersi* in a series of 13 has blue flecks in a band above the aurora on the upperside of the secondaries. One female in six from Mid Hills, San Bernardino Co., has some basal blue, and four females from Cima, San Bernardino Co., have some basal blue, apparently lacking in other *dammersi* populations.

Ssp. *dammersi* is sympatric (but allochronic) with *battoides martini* at Clark Mtn. and Horse Thief Springs, San Bernardino Co., with *enoptes mojave* in the Providence Mts., and sympatric and synchronic with a dwarf *battoides ellisii* form at Clark Mtn. At 4 mi. E. Cherry, Yavapai Co., Arizona, *dammersi* flies, while at Cherry itself, only *rita rita* is reported. Likewise, these two subspecies are sympatric and synchronic or nearly so at 1 mi. S. Hillside, Yavapai Co. Both species use *Eriogonum wrightii* var. *wrightii* at these localities.

Comstock & Henne (1965) observed oviposition and reared adults of *dammersi* from *Eriogonum elongatum* at Snow Creek and Chino Canyon near Palm Springs, Riverside Co., California. As they point out, *E. elongatum* "is more widely distributed in southern California and Baja California than is the associated butterfly." It is also associated with *E. elongatum* at Banning, Riverside Co., and at Manzanita, San Diego Co. I have checked a number of localities for *E. elongatum* in southern California during September without locating *dammersi*.



Map 2.—Distribution of *S. enoptes dammersi*.

E. elongatum var. *elongatum* occurs in coastal central and southern California and northern Baja California, Mexico, flowering from August to November. *E. wrightii* var. *wrightii* is found in southeastern California eastward to western Texas and southward to northern Mexico, flowering from July to September. Var. *membranaceum* is distributed in southern California and northern Baja California, flowering from August to October.

Shijimiaeoides enoptes ancilla (Barnes & McDunnough, 1918)

Barnes & McDunnough. 1916. *Contrib. Nat. Hist. Lepid. N. Amer.*, vol. 3, pl. 11, ff. 2 & 5 (as *glaucon*), p. 152.

Barnes & McDunnough. 1917. *Contrib. Nat. Hist. Lepid. N. Amer.*, vol. 3, pl. 17, f. 2 (as *glaucon*), p. 264.

Barnes & McDunnough. 1918. *Contrib. Nat. Hist. Lepid. N. Amer.*, vol. 4, pp. 77-79 (O. D. fixed here).

In 1918 Barnes & McDunnough published a correction to their assertion in 1916 and 1917 that *glaucon* was the Great Basin race of *enoptes*, after viewing the type specimen of *glaucon* and finding it had a *battroides* genitalia (see discussion of *glaucon* under *spaldingi* in Part IV). Thus they erected the name *ancilla* for this *enoptes* subspecies which otherwise so closely resembles *battroides glaucon*. Phenotypically ssp. *ancilla* differs only slightly from *glaucon* in having, especially in females, "a rather rougher squammation on the underside and a thickening of the black basal fringe line; the males show only traces of fulvous on upper side of secondaries." Ssp. *glaucon* and *ancilla* are separated with assurance only after examining the male genitalia. "Our type specimens are a series of 6 ♂, 4 ♀ from Eureka, [Juab Co.], Utah (July 1-7)." Two of these were figured in black-and-white as *glaucon* in 1916; these leave no doubt about the proper identity of *ancilla*. I have examined a series of 10 ♂ 4 ♀ *ancilla* from Eureka, 6500-7500', Juab Co., Utah, taken in June and July (CM, gen. det.). So far, *glaucon* has not been found in Utah. Langston's (1969) statement that *ancilla* is geographically sympatric with *rita pallescens* in northwestern Utah is true in the broad sense, but I am unaware of any specific localities where the two fly together.

Number of teeth on terminal end (cucullus) of valve = 9 (3), 10 (3), 11 (3), 12 (3), 13 (3), 14 (5), 15 (3); N = 23, average = 13-14. The localities are mostly Kingston Canyon and Bonanza Gulch, Nevada; others are singletons from seven localities.

DISTRIBUTION (viewed 225♂ gen. from 105 localities): COLORADO: *Adams Co.*: Denver, 1♂, viii (CM). *Boulder Co.*: Boulder, 1♂ 1♀, vi (AM); Boulder Canyon, 14♂ 5♀, v, vii (YU, AM); Buckingham Pk., 6500', 1♂, vi (YU); Chataqua Mesa, 6♂ 5♀, v (JS); Eldora, 2♂, vi vii (YU); Flagstaff Mt., 7♂ 6♀, vi, vii (AM, YU, LACM, DG); 4-Mile Creek above Sunset, 7♂, vi (AM, JS, LACM); 4-Mile Canyon nr. Sunset, 8♂, vi, vii (PO, SE, AM, LACM); Gregory Canyon, Boulder, 36♂ 2♀, v-vii (YU, LACM, JS, AM); Lefthand Canyon, 4♂, vi (AM, LACM); Magnolia, 1♂, vii (YU); Nederland, 1♀, vii (AM); Pennsylvania Gulch, near Sunset, 1♂ 1♀, vii (JS, AM); Sawmill Hill, nr. Ward, 1♂, vii (LACM); Six Mile Canyon, 1♂, v (LACM); R. R. Grade, NW Sugarloaf, 2♀, vi (PO). *Clear Creek Co.*: Clear Creek, 4♂ (CM); Fall River Rd., 7500', 2 mi. W Idaho Springs, 7♂ 1♀, vi, vii (MF); nr. Morrison, 1♂ 1♀, v (BM); Mt. Evans, 13,000', 1♂, vii (CM); York Gulch, 8000', Fall River, 1♂, vi (JS). *Delta Co.*: Black Ridge, 6500', Smith Fork Canyon, 14♂ 9♀, vi (SE, LACM). Gunnison River, 5 mi. S Austin, 6000', 2♀, vi (SE); S end of Landing Field, E side Redlands Mesa, NE $\frac{1}{4}$ of SW $\frac{1}{4}$, sec. 16, T14S, R93W, 6300', 21♂ 2♀, v (AM); Rogers Mesa, 5850', nr. Filter Plant, 3♂, v (SE); Smith Fork Canyon, 5500', 4♂ 2♀, v, vi (SE, LACM); Smith Fork of Gunnison R., W Hotchkiss, 1♂, v (SE); 2 mi. S Smith Fork Canyon, 6500-7000', 4♂, v (SE). *Eagle Co.*: 2 mi. N Basalt, 7500', 1♂, vi (SE). *Garfield Co.*: E. Elk Creek, 6800-7000', 8♂, vii (SE); No Name Creek, 6400-7400', 1♂, vii (SE). *Gilpin Co.*: Golden, 2♂ 1♀, vi (UCD, CM); 1 mi. into N. Fork Clear Creek Canyon, 16♂ 7♀, vii (JS); Rollinsville, 1♂, vii (AM). *Grand Co.*: Beaver Creek, 1♂, vii (JS); Grand Lake, 1♂, vii (CM). *Gunnison Co.*: 1.5 mi. N Almont, Hwy. 135, 1♀, vii (AM); Black Mesa, 8500', 1♂, vii (SE); Black Mesa Rd., 8500', 7♂ 1♀, vii (SE); Cement Creek, 1♂, vii (CIS); Curecanti Creek, 9000', 1♀, vi (SE); Gothic, 9500-10,500', 4♂, vi, vii (YU, AM); Hwy. 50, 5 mi. W Gunnison, 7000', 9♂ 6♀, vi (SE); Vulcan, 7 mi. S Iola, 1♂, vi (SE). *Jefferson Co.*: Bear Crk. Canyon, 6000', nr. Morrison, 14♂ 1♀, vii (MF); Castle Rock nr. Golden, 24♂ 26♀, v (JS, LACM); Chimney Gulch, 5♂ 6♀, v, vi (CM); gulch $\frac{1}{4}$ mi. S Chimney Gulch, 11♂, vi (JS, GG); Clear Creek Canyon, 2♂ 1♀, vi (SE, LACM); Cub Creek, Evergreen, 1♂, vi (AM); Dedisce Park, Evergreen, 1♂ 3♀, vii (AM); Deer Creek Canyon & Hwy. 75, 1♂, vii (CIS); Golden Gate Canyon, 1♂, vi (JS); Indian Hills, 3♂ 1♀, vii (AM); Lookout Mt., 6500-7200', above Golden, 9♂ 6♀, vi, vii (DG,

BM, LACM, MF); Mother Cabrini Shrine, 3♂ 1♀, vi (JS, AM); Phillipsburg, 4♂ 4♀, vii (JS); Platte Canyon, 2♂ 1♀, v (CM); Red Rocks Park, 25♂ 8♀, vi (CIS, JS, LACM); Rooney Ranch, 1♀, v (AM); Table Mtn., 2♀, v (JS); E end of S. Table Mtn., 7♂ 3♀, v (JS); Whitehall, 1♂, vii (CM). *Larimer Co.*: 3 mi. W Bellevue, 6700', 3♂ 1♀, vi (MF); Copeland Lake, Long's Pk. Trail, Estes Park, 1♂, (MCZ); Horsetooth Res. Area, 5400', 1♂ 1♀, vi (MF); Lily Lake, Estes Park, 1♀, (MCZ); Long's Pk. Inn, Estes Park, 9500', 20♂ 6♀, (MCZ); Soldier Canyon, 6000', 1♂, vi (MF). *Moffat Co.*: Juniper Mtn. W of Craig, 1♂ 2♀, vi (SE); Plug Hat Picnic Area, 7000', Dinosaur Nat'l Mon., 1♂, vi (SE). *Montezuma Co.*: Navajo Canyon, 8000', Mesa Verde Nat'l Park, 1♀, vi (AM). *Pitkin Co.*: Aspen Area, 7500-9500', 3 mi. W., 1♂, vi (MF). *Routt Co.*: 4 mi. N Hayden, 10♂ 3♀, vi (LACM, SE). *IDAHO*: *Cassia Co.*: Bostetter Cmpgd., Rock Cr.-Oakley Rd., 7000', Sawtooth Nat'l For., 3♂ 1♀, vii (AM); 2 mi. E. Bostetter Cmpgd., 7000', 1♀, vii (AM); Divide N. of Cache Peak, Oakley-Elba Rd., Sawtooth Nat'l For., 7500', 28♂, vii (AM); Rock Creek, S. of the village of Rock Crk., Sawtooth Nat'l For., 6000', 3♂, vii (AM). *MONTANA*: *Madison Co.*: Three Forks, 2♂, vi (CM). *Sweet Grass Co.*: sage hilltop nr. Big Timber Creek, 4400', 1♂, vi (JS); Little Timber Creek, 5743', Crazy Mts., 1♂, vi (YU). *County undetermined*: Big Timber Canyon, ca. 6500', (Half Moon Park), Crazy Mts., 1♂, vi (AM); Rock Creek & Madison River, Gallatin Nat'l For., 1♂ 3♀, (CM); Teepee Creek & Madison River, Gallatin Nat'l For., 2♂ 2♀, (CM). *NEVADA*: *Elko Co.*: Angel Lake, 8100', Ruby Mts., 13 mi. SW Wells, 1♂, vii (AM); Horns Gulch, Mountain City, 1♂, vi (CIS); Jarbridge, 6500', 2♂, vii (KH); approx. 3 mi. S Jarbridge, 6500', 4♂, vii (JL, KH); Jarbridge Wilderness, Pine Creek Camp Rd., 1♀, vii (AM); Pine Creek, nr. Jarbridge, 2♂, vii (GG). *Humboldt Co.*: Indian Crk., 6000', Santa Rosa Mts., 4♂, vii (AM); Martin Creek Ranger Station, 7000', Santa Rosa Range, 2♂, vii (AM). *Lander Co.*: lower end Birch Creek Canyon, 6200-6500', Toiyabe Range, 2♀, vi (AM); 4 rd. mi. E. Carroll Summit, 6700', 9♂ 10♀, vi (AM); Kingston Canyon, Toiyabe Range, 5♂ 1♀, vii, viii (JL, AM); S & W-facing slopes of Victorine Canyon, 8000-10,000', S side of Bunker Hill, Toiyabe Range, 67♂ 41♀, vii (AM). *Nye Co.*: Summit Canyon, 7000-7200', E side Toiyabe Range, 30♂ 1♀, vi, vii (AM). *Pershing Co.*: Buena Vista Creek, 5700-6300', E slope Humboldt Range, 2♀, vii (AM). *Washoe Co.*: "T. H. Ranch Ca. Pyramid Lake", 7♂, vi (LACM). *OREGON*: *Harney Co.*: ½ mi. W Burns P.O.,

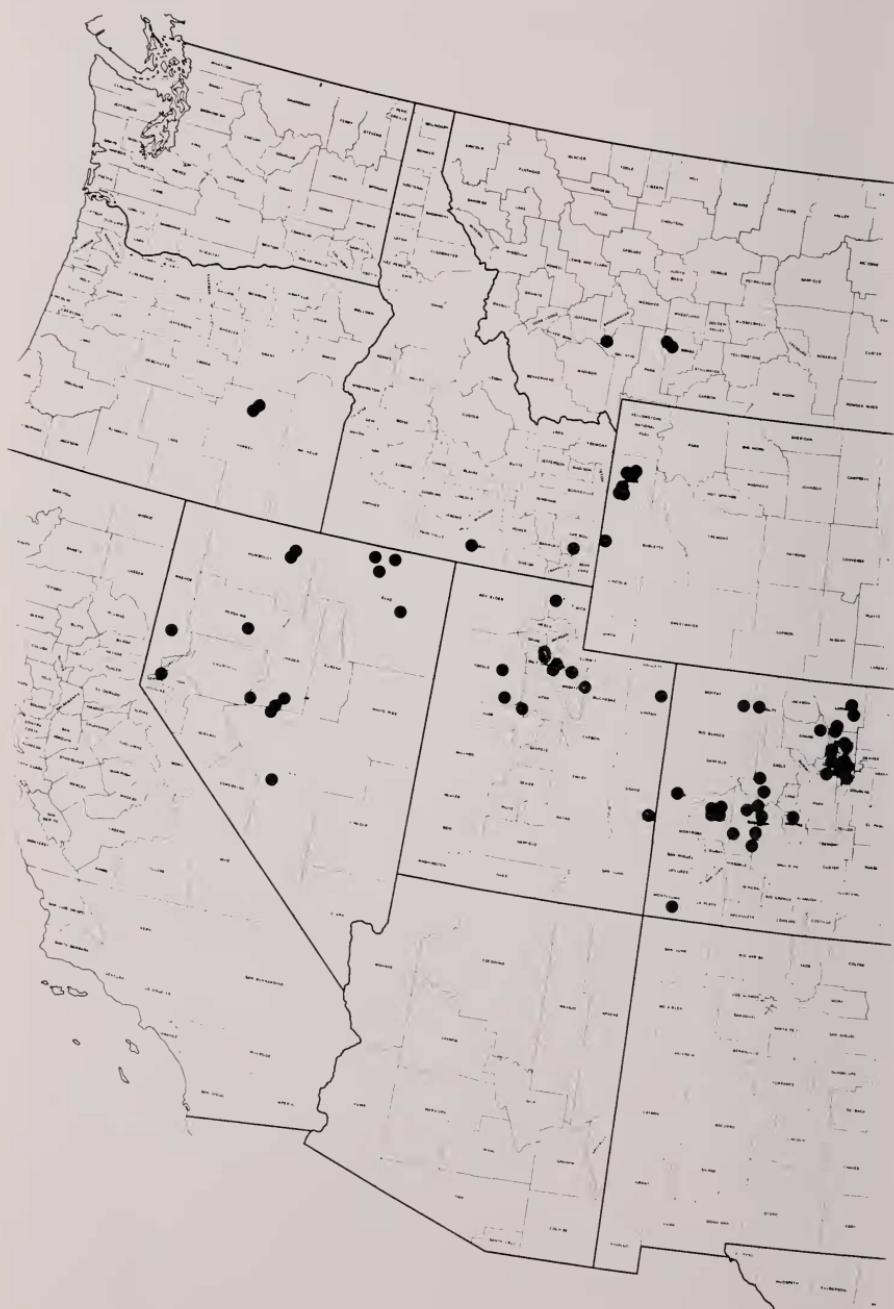
4100', 3♂ 5♀, vi (CIS); Devine Canyon, 12 mi. N Burns, 5036', 1♂, vi (CIS). UTAH: *Cache Co.*: Green Canyon, nr. Logan, 9♂, vii (AM). *Davis Co.*: Mill Creek Canyon, 5300', 1♀, vi (CIS); Mueller Park, Wasatch Mts., 1♂, vi (AM). *Duchesne Co.*: Wolf Crk. Cyn., 7320', 14 mi. NW Tabiona, 4♂, vi (CIS). *Emery Co.*: Big Spring Wash, 2♂ 4♀, v (KT). *Juab Co.*: Eureka, 6500-7500', 10♂ 4♀, vi, vii (CM). *Salt Lake Co.*: Alta, 4♂ 2♀, vii (MCZ); City Creek Canyon, 5300', 4♂, vi (CIS, MCZ, CM); Lamb's Canyon, Wasatch Mts., 2♂, vii (AM); Mill Crk., 6000', Wasatch Mts., 2♂, vi, vii (AM); Mineral Fork, Big Cottonwood Canyon, 1♂, vii (KT); Parleys Canyon, 6000', 1♀, vi (CIS). *Summit Co.*: Co-op Creek, Uintah Mts., 1♀, vii (KT); East Canyon, 1♂, vi (CIS); 5 mi. E Kamas, 7500', 4♂, vi (CIS); ½ mi. S Kimball Jct., Uintah Mts., 4♂ 3♀, vi (LACM, AM); Park City, 11♂ 5♀, vii (CM); N. Fork Provo River, 7500', Uintah Mts., 5♂ 2♀, vii (LACM, AM, KT); Shingle Creek, Uintah Mts., 11♂ 5♀, vi, vii (JS, KT, LACM); Snyderville, 21♂ 25♀, vi (AM, DG, JS, KT, LACM); nr. Snyderville, 3♂ 1♀, vii (JS, KT); St. Hwy. 105, 7000', 4♂ 8♀, vii (DB). *Tooele Co.*: Bennion Crk., Sheeprock Mts., 3♂, vi (AM); South Willow Creek, Stansbury Mts., 4♂, vi, vii (SE, KT, CIS); Stockton, 7♂ 2♀, vi (CM). *Uintah Co.*: Blue Mtn. Plateau, 8000', Dinosaur Nat'l Mon., 1♂, vi (SE); S slope Blue Mt., 8000', 1♂, vi (CM). WYOMING: *Albany Co.*: Johnson Creek, Sybille Canyon, 1♂, vi (DG); Sybille Canyon, 6500', 6♂ 3♀, vii (DG). *Lincoln Co.*: Swift Creek, nr. Afton, 6♂ 1♀, vi (AM). *Park Co.*: Roosevelt Camp, Yellowstone Nat'l Park, 1♀, vii (CAS). *Sublette Co.*: Elkhart Park, 1♂, vii (DG). *Teton Co.*: Blacktail Butte, Teton Mts., 1♂, vi, vii (MCZ); Grant Teton Nat'l Park, 8♂ 4♀, vi (CAS); 4 mi. E. Jackson, 13♂, vii (AM); 6 mi. N. Jackson, 1♀, vii (DG); Jackson Hole, 1♂, vi (CAS); Jenny Lake, Teton Mts., 32♂ 13♀, vi, vii (CM, YU, LACM); Moose, Teton Mts., 3♂, vi (LACM); Moran, 3♂ (CM); the Potholes, G. Teton N. P., 8♂, vi (JS, LACM); Signal Mt., Teton Nat'l Park, 2♂ 5♀, vii (LACM); String Lake, Teton Mts., 11♂ 4♀, vi (LACM); Strong Lake, 6750', Grand Teton N. P., 1♂, vii (CIS); Teton Mts., 14♂ 1♀, vii (MCZ, CM); Teton Pass, 8400', 3♂ 1♀, vii (DG, AM); Teton Trail, Teton Mts., 8♂, vi (LACM); Timber Island, Teton Mts., 1♂ (CAS). Some additional records appear in De Foliart (1956) and Klots (1930).

HOSTS: *Eriogonum heracleoides* Nutt. var. *heracleoides*. IDAHO: *Bear Lake Co.*: 8 Mile Canyon, S of Soda Springs,

Cache Nat'l For., 6500', 2♂ 2♀, vii (AM), adult assoc. (*Ellis* #1086). NEVADA: Elko Co.: slope ½ air mi. S of Bonanza Gulch, 8000-9500', T46N, R58E, sec. 27, 28, 34, Jarbidge Mts., 14♂ 6♀, vii (AM), oviposition (*J. F. Emmel* #195). *Eriogonum umbellatum* Torr. var. *aureum* (Gandg.) Reveal. COLORADO: Pitkin Co.: Aspen (NE end of airport, hill-slope), 1♂ 1♀ reared from larvae (AM), (*Shields* #137); the ants *Tapinoma sessile* (Say) and *Formica montana* Emery (det. R. R. Snelling) were tending the larvae. NEVADA: Lander Co.: Kingston Canyon, 6600-6800', Toiyabe Range, 10♂ 4♀, vi (AM), adult assoc. (*Shields* #1). *Eriogonum umbellatum* Torr. var. *umbellatum*. NEVADA: Nye Co.: 5 rd. mi. W Five Mile Springs on US Hwy. 6, 6400', NW ¼ T3N, R57E, S end Monitor Range, 2♂ reared from larvae (AM), (*J. F. Emmel* #183). UTAH: Grand Co.: Gateway-Castleton Rd., 2 mi. W Polar Mesa turnoff, N side LaSal Mts., 8400', 1♂, vi (AM), adult assoc. (*Ellis* #1049). *Eriogonum umbellatum* Torr. var. *nevadense* Gand. NEVADA: Lander Co.: 4.0 rd. mi. E Carroll Summit, 6700', 9♂ 10♀, vi (AM) adult assoc. (*Shields* #208). *Eriogonum lobbii* Torr. & Gray var. *robustius* (Greene) M. E. Jones. NEVADA: Lyon Co.: 1 mi. N Silver City, 1♂ 3♀, vi (AM), adult assoc. (*Shields* #186). *Eriogonum strictum* Benth. ssp. *proliferum* (Torr. & Gray) S. Stokes var. *proliferum* (Torr. & Gray) Reveal. NEVADA: Elko Co.: Wildhorse Reservoir, Hwy. 51, 64 mi. N Elko, 6500', 9♂ 1♀, vi (AM), oviposition (*Ellis* #1073). *Eriogonum ovalifolium* Nutt. var. *ovalifolium*. COLORADO: Mesa Co.: Monument Cyn. trailhead, 5000', Colorado Nat'l Mon., 1♂, iv (AM), adult assoc. (*Ellis* #1002). See Map 3.

Ssp. *ancilla* flies from late April to early August.

A small-sized variety of *ancilla* with light blue males occurs at the following localities: Black Ridge, Austin, Redlands Mesa, Rogers Mesa, and Smith Fork Canyon, Delta Co.; Black Mesa, Curecanti Creek, and Gunnison, Gunnison Co.; Monument Canyon, Mesa Co.; Juniper Mtn. and Plug Hat, Moffat Co.; and Hayden, Routt Co., all in Colorado; Big Spring Wash, Emery Co.; Bennion Creek, Tooele Co.; and Blue Mtn. Plateau, Uintah Co., all in Utah. Superficially these resemble *enoptes mojave* but appear closest to *ancilla*. They are probably associated with *Eriogonum ovalifolium* var. *ovalifolium* (see host record for Monument Canyon). One dwarf female from a typical *ancilla* population at Snyderville, Summit Co., Utah, is extraordinarily similar to female *mojave* on the underside. Perhaps *ancilla* and *mojave* are linked by way of this small, light form from Utah



Map 3.—Distribution of *S. enoptes ancilla*.

and western Colorado. Both subspecies average 13-14 teeth on the valve and have the curved edge bearing the teeth upturned to a 45° angle (also true in *dammersi*).

Specimens from the vicinity of Burns, Harney Co., Oregon, are typical *ancilla*, despite the fact that they are geographically close to the range of *enoptes columbiae*. Several specimens in a series of 26 male *columbiae* from Mill Creek, Umatilla Co., Oregon, approach *ancilla*.

A male from Mt. Charleston, 7200', Clark Co., Nevada, VI-26-59 (J. C. Downey, CIS) is nearest *ancilla* although the black borders are wide (see fig. 3-4); *enoptes* nr. *enoptes* also flies in the vicinity.

Although *ancilla* is usually readily distinguishable from *battoides centralis*, *ancilla* resembles *centralis* on the underside at Grand Lake, Grand Co., and Platte Canyon and Castle Rock, Jefferson Co., Colorado.

Ssp. *ancilla* approaches the range of *battoides glaucon* in western Nevada, at Pyramid Lake and Silver City. In Elko Co., Nevada, the two nearly overlap in range, *glaucon* occurring north of Jarbidge on the Nevada-Idaho border and *ancilla* flying in the Jarbidge Mts. at Pine Creek near Jarbidge, Jarbidge, 3 mi. S. Jarbidge and Bonanza Gulch. Based on genitalia, two specimens from 8 mi. N. of Jarbidge appear to be hybrids between the two.

Development of the orange auroral band on the lower half of the underside primaries is present in an occasional *ancilla* specimen from Birch Creek Canyon and Kingston Canyon, Lander Co., Nevada, and about half the females from Black Ridge, Delta Co., Colorado, have a tinge of this primary aurora. One male *ancilla* from Kingston Canyon is unusually large, about the size of many *spaldingi*, with some orange on the veins and a partial orange band on the underside of the primaries.

Eriogonum heracleoides var. *heracleoides* occurs from southeastern Washington south to northeastern California, eastward to Montana, Wyoming, and Colorado, flowering from May to August. *E. umbellatum* var. *umbellatum* is common from Washington to northern California eastward to Montana and Colorado, flowering from June to September. Var. *aureum* is widespread at lower elevations from Nevada to central Colorado, and in scattered locations across Idaho and south-central Wyoming, flowering from June to August. *E. lobbii* var. *robustius* is infrequent in extreme west-central Nevada south and west of Reno, flowering from July to August. *E. strictum* ssp. *proliferum*

var. *proliferum* ranges from Washington to central California and eastward to western Montana, flowering from June to August. *E. ovalifolium* var. *ovalifolium* is widespread and exceedingly variable, from British Columbia to southern Alberta southward through Washington and eastern Oregon into California along the eastern flank of the Sierra Nevada to northern San Bernardino Co., and southward from Canada along a broad front through Idaho and Montana into Nevada, Utah, Wyoming, and Colorado as far south as northwestern New Mexico and northern Arizona, flowering from April to July.

Shijimiaeoides enoptes enoptes (Boisduval, 1852)

(See discussion in Part IV)

Number of teeth on terminal end (culcullus) of the valve = 13 (2), 14 (5), 15 (3), 16 (3), 17 (6), 18 (3), 19 (2), 20 (3), 21 (1), 23 (1); N = 29, average = 16-17, mostly from Lake Spalding and Tehachapi Mts., with ten other localities sampled.

DISTRIBUTION (viewed 112♂ gen. from 78 localities): **CALIFORNIA:** Alpine Co.: Brightman Station, 4♂, vii (KH); Ebbetts Pass, 1♂, vi (LACM); Hermit Valley, 2♂, vii (JS); Hope Valley, 2♂, vii (CIS); Sonora Pass Ridge, 9700', 4♂, vi (CAS); Woodfords, Voight Canyon, 1♀, ix (DB). Calaveras Co.: Bloods Crk. at N Fork Stanislaus River, 2♂ 2♀, vii (AM, LACM); Camp Wolfeboro, 5600-5800', N Fork Stanislaus River, 7♂ 1♀, vi, vii (LACM, PO, KH); N Fk. Stanislaus R., S Big Meadows, 4♂ 1♀, vi, vii (CIS); N Fk. Stanislaus R., 2 air mi. E of E end Big Meadow, 1♂, vii (AM). El Dorado Co.: China Flat, 1♂, vii (AM); China Flat Campground from Silver Fork Rd. from Kyburz, 6♂ 2♀, vi, vii (LACM, AM, NL); Echo Lake, 5♀, vii (LACM); Glen Alpine Creek, 1♂, vii (DB); 6 mi. N Ice House Rd. off Hwy. 50, 1♂, vii (AM); Pilot Creek, 2♂ 1♀, vii (CIS); 4 mi. N Riverton on Ice House Rd., 5♂ 2♀, vi (AM); Twin Lakes, 2♂ 1♀, vii (PO); Wright's Lake, 1♂ 2♀, vii (PO). Fresno Co.: Huntington Lake, 1♂ 1♀, vi (LACM). Glenn Co.: Hull Mtn. Lookout & ridge to E, ca. 6600-6900', W edge Glenn Co., 1♂ 1♀, vii (AM); Plaskett Mdws., 4♂ 1♀, vi (AM). Humboldt Co.: Orleans, 1♂ 1♀, vi (CIS). Inyo Co.: Argus Mts., 1♂, vii (LACM); Brewery Spring, 4880', Surprise Canyon, Panamint Range, 1♂, vi (MCZ); Lone Pine Lake, 8500', 1♂, vi (CIS); near Mono Pass, 10,000-11,900', 5♂, viii (MCZ, PO); Onion Valley Rd., 6800', nr. Tub Springs, 4♂ 2♀, viii (LACM,

SE); Ruby Lake, 11,500', 1♀, viii (PO); above Ruby L., NW Inyo Co., 1♀, ix (CIS); Whitney Trail, 9000', 1♀, vii (CIS). *Kern Co.*: Blackburn Canyon, Tehachapi Mts., 1♂ 1♀, vii (NL); Havilah, 1♂ 1♀, vi (LACM, CM); 4 mi. SE Keene, 1♀, ix (CIS); entrance Kern Co. Park, 5200', Tehachapi Mts., 3♂, vi (NL); up draw NW of jct. Lebec-Frazier Park Rd., 1♂, vii (NL); Pine Tree Mine, 5000', Tehachapi Mts., 4♂, vi (NL). *Lake-Glenn Co. lines*: 2.0 rd. mi. S Hull Mtn. Lookout turnoff just S of Hull Mtn. summit, 3♂ 6♀, vii (AM); 3 rd. mi. SSE of Hull Mtn. Lookout, along Boardman Ridge, 1♂ 1♀, vii (AM). *Lassen Co.*: Bridge Crk. Campground, 1♀, vii (CIS); W side Eagle Lake, 1♂, vi (LACM). *Los Angeles Co.*: Big Rock Crk., nr. Valyermo, 5♂ 10♀, viii (GG); dirt rd. to Horse Flats Campground from Angeles Crest Hwy. (1.0 mi. off hwy.), just N of Chilao Rec. Area, ca. 5900', San Gabriel Mtns., 1♂, vi (AM); 0.7 rd. mi. N Newcomb Ranch Inn, wash bottom off hwy., 5500', San Gabriel Mts., 1♂, vi (AM); Pacifico Mtn., 6400', San Gabriel Mts., 2♂, vii, viii (AM); San Antonio Canyon, 1♂ (CAS); So. Fork Campgd., So. Fork Big Rock Creek, San Gabriel Mts., 5♂ 5♀, ix (JL). *Madera Co.*: Minaret Ridge, 9265', 1♂ 1♀, viii (AM). *Mariposa Co.*: Tenaya Canyon, Yosemite, 1♀, vii (LACM). *Modoc Co.*: .8 rd. mi. E jct. of Hwy. 395 & 299, along Hwy. 299, NE of Alturas, 1♀, vii (AM); 3 rd. mi. E Pine Creek (town), Warner Mts., 2♂, vii (AM); Fandango Pass, 6100', 2♂ 3♀, vii (CIS); Pine Creek, 4800-5100', 1-2 mi. E Pine Creek (town), 6♂ 6♀, vii (AM). *Mono Co.*: Lake Lundy, 1♂, vii (KH); 1 mi. SE Lake Mary, 1♂, vii (LACM); Lundy Lake, 1♂, vii (PO); Mammoth, 8♂ 3♀, vii (LACM); Mammoth Camp, 3♂ 1♀, vii (LACM); Mammoth Lakes, 5♂ 2♀, vi, vii (LACM, CIS, YU); Minaret Pass, 1♂, vii (LACM); Minaret Summit, Mammoth Lakes, 13♂ 8♀, vii (LACM, AM); Saddlebag Lake, 5♂ 3♀, vii (AM, LACM); Sherwin Summit (old 395), 1♂ 1♀, ix (CIS); Sonora Pass, 1♂, vii (LACM); Tioga Pass, 5♂ 2♀, vii, viii (JL, LACM); W above Tioga Pass, 5♂ 4♀, vii (AM, LACM); 4.9 mi. E Tioga Pass, Hwy. 120, 9400', 1♂ 1♀, vii (AM). *Nevada Co.*: Bear River nr. Fuller Lake, 3♂ 1♀, vii (CIS); Donner Pass, 1♂, vii (CIS); Donner Summit nr. Truckee, 3♂ 1♀, vi, vii (AM); Truckee, 4♂ 6♀, vii (CM); entrance to Lake Spalding, 17♂ 12♀, vii (AM, CIS). *Placer Co.*: Big Meadows, 1♂ 2♀, vi, vii (CIS); Cisco, 6000', 2♀, vii (CIS, DB); Donner Summit, 1♂ 4♀, vii (AM); Lake Tahoe, 1♂, viii (UCD). *Plumas Co.*: Blairsden, 1♀, vii (DB); nr. Chester, 1♂, vi (AM); Keddie,

2♂ 1♀, vi (YU); 4 mi. W Quincy, 1♂, vi (CIS). *San Bernardino Co.*: Lytle Creek, 7000', San Gabriel Mts., 27♂ 8♀, vii, viii (JL, LACM); Upper Lytle Crk., 20♂ 15♀, viii (KH, PO). *San Luis Obispo Co.*: Cottonwood Pass, 2000', 1♂, ix (AM). *Shasta Co.*: 3 mi. N Burney, 1♂ 3♀, vii (CIS); between Caieye & Ellery Crks., 15-16 rd. mi. NE of Hwy. 5 (McCloud arm Shasta Res.), 1♂, v (AM); 2 mi. N Hat Crk., 1♂ 1♀, vii (CIS); Old Station, 1♀, vi (CIS). *Sierra Co.*: 4 mi. N Camptonville, 11♂ 4♀, vi (PO); 10 mi. W Downieville, 5♂ 3♀, vi (CIS); Glen Alpine Crk., 6500', 1♂, vii (KH); Gold Lake, 3♂ 4♀, vii (AM); Shenanigan Flat, 12 mi. W Downieville, 2♂ 3♀, v, vi (PO); Sierra City, 1♂, vi (CAS); W of Sierra City, 4♀, vi (PO); Sierraville, 1♂, vii (CAS). *Siskiyou Co.*: Black Butte, 1♀, viii (CIS); Klamath Lodge, Doggett Creek, 1♂, vi (DB); SW entrance to Lava Beds Nat'l Mon. (rd. from McCloud), nr. Mammoth Crater, 5100', 4♂ 2♀, vii (AM); McBride Spgs., 5000-5500', nr. base Mt. Shasta, 4♂ 2♀, vii (GG); McCloud, 1♀, vii (CAS); 5 mi. E McCloud, 2♂ 2♀, vi, vii (CIS); Jet. Mt. Shasta Rd. (Hwy. A-10) & McBride Springs Cmpgd. Rd., 5♂ 5♀, vii (JL, KH); Mt. Shasta City, 3♀, vi, vii (CIS); 2 mi. N Mt. Shasta City, 6♂ 2♀, vi (CIS); Pumice Stone Well, 5♂, vii, (LACM); So. Fork Sacramento River nr. Mt. Shasta, 3800', 1♂ 1♀, vii (CIS); Soda Sprgs., 1♂, vi (CM). *Tehama Co.*: rocky outcropping on Lassen Trail Rd., 5300', T27N, R3E, S11, nr. Onion Butte, 1♂ (SM). *Trinity Co.*: Carrville, 2♀, vii (CIS). *Tulare Co.*: Monarch Lake, 10,000', 1♂, vii (CM). *Tuolumne Co.*: Big Oak Flat, 2♀, vi (CAS); Big Prater Mdws., N Fork Stanislaus R., 1♂, vii (CAS); Brightman Flat, 2♂ 1♀, vii (PO); Chipmunk Flat nr. Sonora Pass, 1♂ 2♀, vi, vii (CIS); 3½ mi. SSW Hetch Hetchy Dam, 4800', 1♂ 1♀, ix (AM); Hog Ranch, 4600', 1 mi. E Mather, 1♂ 1♀, vii (CIS); Relief Res., nr. Sonora Pass, 1♂, vi (CIS); Sonora Pass, 1♂, vii (CIS); 5 mi. W Sonora Pass, 3♂ 1♀, vii (CIS); NW above Tioga Pass, 1♀, viii (CIS); Tuolumne Mdws., Yosemite, 3♂ 1♀, vii (CIS, CAS). *Ventura Co.*: Mt. Pinos, 1♂, viii (LACM). *County undetermined*: G. Alpine Cr., Tahoe, 1♂, vii (CIS); Sonora Pass, 8000', 2♂, vi (UCD); nr. Sonora Pass, 1♂ 1♀ (CIS); Tamarak L., Tahoe, 1♂, vii (CIS); nr. Vidette Meadows, 2♂, vii (CIS). *Erroneous (?)*: Mt. Baldy, 2♂, viii (CAS). *NEVADA*: *Clark Co.*: end Kyle Canyon, Mt. Charleston, 1♀, vii (LACM); Mt. Charleston, 1♂, vii (AM). *Douglas Co.*: W side Carson Valley, 1♂, ix (DB); SW of Genos, Kingsbury Grade, 5700', 5♂ 1♀, vii (CIS); Glenbrook Creek, 2♂ 1♀,

vii (DB); Haines Canyon, 5000', 6♂ 1♀, v, viii, ix (DB); Kingsbury Grade, 8♂, viii (NSM); St. Hwy. 19, spring, 5500', 5♂, v, viii (DB). *Ormsby Co.*: Kings Canyon, 3♂, vii (NSM). *Washoe Co.*: Verdi, 2♀, viii (CIS). *OREGON*: *Gilliam Co.*: 4.5 mi. S Condon, 2500', 1♂, v (AM). *Josephine Co.*: Grants Pass, 2♂, vi (CM). *Lake Co.*: Warner Cn. Ski area, 12 mi. NE Lakeview, 5450', 3♂, vii (AM). *WASHINGTON*: *Klickitat Co.*: "Klickitat V., W.T.", 1♂, vii (MCZ).

HOSTS: *Eriogonum nudum* Dougl. ex Benth. var. *pauciflorum* S. Wats. **CALIFORNIA:** *Los Angeles Co.*: South Fork Big Rock Creek, est. 4500', San Gabriel Mts., 6♂ 11♀, viii-x (AM, CIS), adult assoc. (*Shields* #63). *Eriogonum nudum* Dougl. ex Benth. var. *deductum* (Greene) Jeps. **CALIFORNIA:** *El Dorado Co.*: along W & SW shore Loon Lake, ca. 15 air mi. N Kyburz, vii (AM), adult assoc. (*Shields* #233); 4 mi. N Riverton on Ice House Rd., 5♂ 2♀, vi (AM), adult assoc. (*Shields* #89); South Fork Silver Creek, ca 1 mi. E Chicken Hawk Spring, 5000', ca. 4 mi. W Ice House Store, "21", vi (AM), adult assoc. (*Shields* #205). *Placer Co.*: ridge between Mt. Judah & Sugar Bowl, 7200-7500', nr. Donner Pass, 8♂ 4♀, vii (AM), oviposition (*J. F. Emmel* #190). *Eriogonum nudum* Dougl. ex Benth. var *pubiflorum* Benth. in DC. **CALIFORNIA:** *Inyo Co.*: E. slope 4 Jeffery Campground, Bishop Crk., 7900', vii (OS), adult assoc. (*Shields* #248). *Modoc Co.*: .8 rd. mi. E jct. Hwy. 395 & 299, along Hwy. 299, NE of Alturas, 1♀, vii (AM), adult assoc. (*Shields* #102); Electric Plant vicinity, Modoc Nat'l For., 3.0 rd. mi. E Pine Creek (town), Warner Mts., 2♂, vii (AM), adult assoc. (*Shields* #104). *Siskiyou Co.*: SW entrance to Lava Beds Nat'l Mon. (road from McCloud) nr. Mammoth Crater, 5100', 4♂ 2♀, vii (AM), adult assoc. (*Shields* #101); ca. 6 rd. mi. NE Weed, on Hwy. 97, 1♀, vii (AM), adult assoc. (*Shields* #224). *Eriogonum nudum* Dougl. ex Benth. var. *nudum*. **CALIFORNIA:** *Glenn Co.*: 1 mi. W Plaskett Ranger Station, NW Alder Springs, 4♂ 1♀, vi (AM), adult assoc. (*Shields* #242); 3 rd. mi. SSE Hull Mtn. Lookout, along Boardman Ridge, Mendocino Nat'l For., 1♂ 1♀, vii (AM), adult assoc. (*Shields* #98). *Placer Co.*: Hwy. 80, 2 mi. E Emigrant Gap, vii, oviposition (*Goodpasture* #11). *Sierra Co.*: 3½ rd. mi. SSW Bassett, on Hwy. 49, est. 4800', "4", vi (AM), adult assoc. (*Shields* #195). *Eriogonum nudum* Dougl. ex Benth. var. *scapigerum* (Eastw.) Jeps. **CALIFORNIA:** *Mono Co.*: Tioga Pass, 10,000', vii (OS), adult assoc. (*Shields* #251). *Eriogonum wrightii* Torr. ex Benth. in DC var. *subscaposum* S. Wats.

CALIFORNIA: *Inyo Co.*: Onion Valley Rd., 6800', nr. Tub Springs, 4♂ 2♀, viii (LACM, SE), adult assoc. (*Shields* #83). *Eriogonum saxatile* S. Wats. CALIFORNIA: *Los Angeles Co.*: dirt rd. to Horse Flats Campground from Angeles Crest Hwy. (1.0 mi. off hwy.), just N Chilao Rec. Area, ca 5900', San Gabriel Mts., 1♂, vi (AM), adult assoc. (*Shields* #91). *Eriogonum davidsonii* Greene. CALIFORNIA: *Los Angeles Co.*: .7 rd. mi. N Newcomb Ranch Inn, wash bottom off Hwy., 5500', N of Chilao Rec. Area, San Gabriel Mts., 1♂, vi (AM), adult assoc. (*Shields* #93). See Map 4.

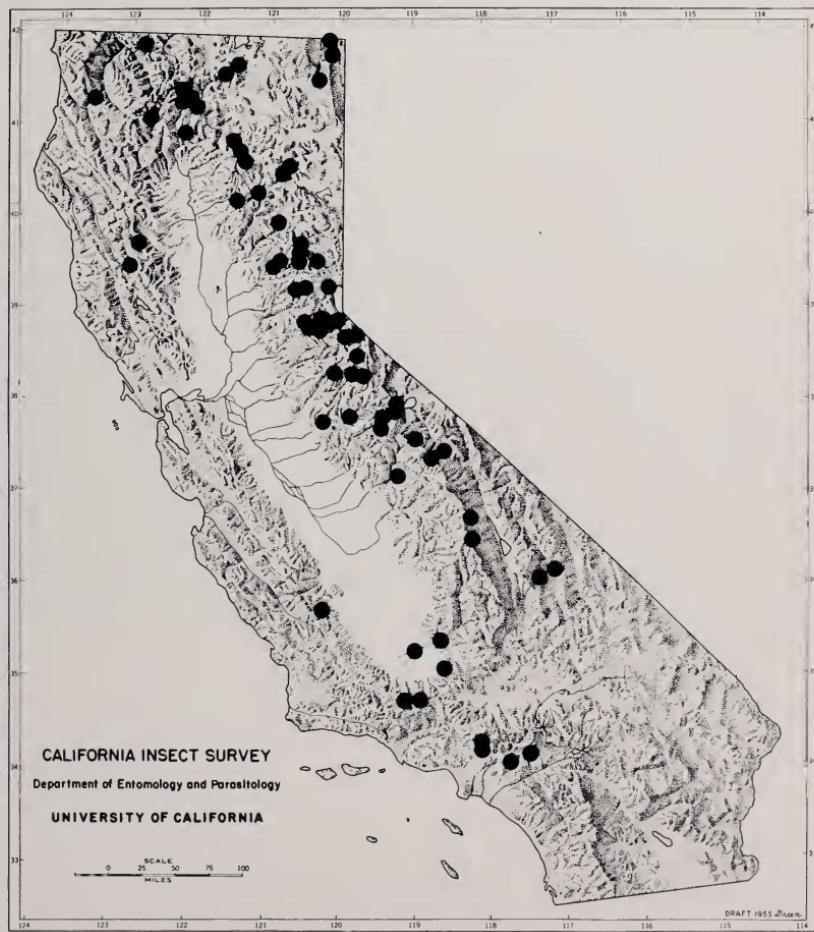
Ssp. *enoptes* is on wing from early May to early October.

A southern California form of *enoptes enoptes* has the broad black borders reduced that are present in males from the Sierra Nevada and northern California and is a lighter blue. This form is found in Kern, Ventura, Los Angeles, and southwest San Bernardino cos. Males from Lytle Creek possess an uppersurface like *enoptes dammersi* but an underside like *enoptes enoptes*. A few females from Big Rock Creek, Los Angeles Co., and one from Lytle Creek, have a slight orange band on the underside of the primaries (as in *battoides comstocki*), one with the lower half predominantly so (in this respect rather similar to *rita spaldingi*).

Ssp. *enoptes enoptes* and *battoides intermedia* are sympatric at Echo Lake and Loon Lake, El Dorado Co.; Donner Summit and Lake Spalding, Nevada Co.; Gold Lake, Sierra Co.; Onion Butte, Tehama Co.; and Carrville, Trinity Co., all in California. A strong tendency in *enoptes enoptes* to resemble *b. intermedia* on the underside is manifest at Chester, Plumas Co.; and Donner Summit, and vice versa at Lake Spalding and Onion Butte. An occasional specimen in an *enoptes enoptes* series from Donner Summit and Truckee, Nevada Co., tends toward *enoptes ancilla* on the underside. Two specimens from Kyle Canyon and Mt. Charleston, Clark Co., Nevada, are like Sierran *enoptes enoptes* on the upperside but are smaller and more heavily marked on the underside.

Ssp. *enoptes enoptes* and *battoides battoides* are sympatric at Mono Pass and Ruby Lake in Inyo Co., Mammoth Lakes and Tioga Pass in Mono Co., and Gold Lake in Sierra Co. A female from Ruby Lake has the underside heavily spotted as in *battoides battoides* but the spots are not rectangular.

At Haines Canyon, Douglas Co., Nevada, *enoptes enoptes* flies in May and again in August.

Map 4.—Distribution of *S. enoptes enoptes* in California.

Eriogonum nudum is widespread from Washington to California and Baja California, eastward into extreme western Nevada. Var. *nudum* is found from southern Washington southward along the coast to near San Francisco and in the mountains from Washington through Oregon to western Nevada and in California to Tulare Co., flowering from June to September. Var. *pubiflorum* occurs from southern Oregon, southward to Monterey Co., and in eastern California to Kern and Inyo cos., flowering from July to October. Var. *deductum* ranges in the Sierra Nevada from Lassen Co., California southward to Inyo Co., and in adjacent extreme western Nevada, flowering from June to September. Var. *pauciflorum* is found in the mountains of southern California from Los Angeles and San Bernardino cos. southward to northern Baja California to San Pedro Martir, flowering from August to October. *E. wrightii* var. *subscaposum* grows in the mountains of eastern and southern California and extreme west-central Nevada, flowering from July to October. *E. saxatile* extends from San Jacinto and San Bernardino mts. west and north to the San Gabriel, Argus, and Panamint mts., and the southern Sierra Nevada north to Fresno Co., in the Santa Lucia Mts., California, and in Nye and Esmeralda cos., Nevada, flowering from May to July. *E. davidsonii* occurs in the southern Coast Ranges and mountains of southern California and northern Baja California eastward into western and northern Arizona, southern Utah, and extreme southwestern Colorado, flowering from June to September.

Shijimiaeoides enoptes tildeni (Langston, 1963)

Langston. 1963 [1964]. *Jour. Lepid. Soc.* 1963, vol. 17; pp. 212-216; f. 3; fig. 5, no. E.

The holotype male was collected at Del Puerto Canyon, 22 mi. W. of Patterson, Stanislaus Co., California, VIII-11-62 (R. L. Langston). This is at best a weakly defined subspecies closely allied to *enoptes enoptes* and *enoptes bayensis*. If *tildeni* deserves a name, no doubt other populations within *enoptes enoptes* should be so considered, although I prefer to treat highly variable subspecies like *enoptes enoptes*, *enoptes ancilla*, *battroides glaucon*, and *battroides ellisi* as plastic subspecies for which infra-population names are superfluous. However, *tildeni* is not hereby reduced to synonymy, to help emphasize its possible evolutionary position between *e. bayensis* and *enoptes*.

enoptes. Ssp. *tildeni* is pictured in black-and-white by Langston, who also figures a drawing of the male genitalia, along with some distribution records.

Number of teeth on terminal end (cucullus) of valve = 12, 17, 18 (N = 3), from Del Puerto Canyon.

DISTRIBUTION (viewed 10♂ gen. from 4 localities): CALIFORNIA: Monterey Co.: 3 mi. SE Parkfield, 1♀, viii (CIS). San Benito Co.: New Idria, 2♀, viii (PO); hills above New Idria, 3200-3600', 2♀, viii (CIS). San Luis Obispo Co.: Cottonwood Pass, 6 mi. NE Cholame, 5♂ 1♀, ix (CIS); Polonio Pass, Hwy. 46, E of Cholame, 1♂, ix (AM); 8 mi. W Simmler, 4♂ 4♀, ix (CIS). Stanislaus Co.: mine, Del Puerto Canyon, ca. 22 mi. W Patterson, 24♂ 2♀, v (AM, GG); 0.3 rd. mi. SSE of mouth of Hideout Canyon, 1550-1600', Del Puerto Cyn. Rd., sec. 16, T6S, R5E, 5♂, vii (AM).

HOSTS: *Eriogonum nudum* Doug. ex Benth. var. *auriculatum* (Benth.) Tracy ex Jeps. CALIFORNIA: Stanislaus Co.: Del Puerto Cyn., 21-22 mi. W Patterson, 26♂ 9♀, vii-ix (LACM, AM, PO, CIS, GG), adult assoc. (J. F. Emmel #144). *Eriogonum covilleanum* Eastw. CALIFORNIA: Stanislaus Co.: ca. 2-3 rd. mi. W of Frank Raines Park, 1300', Del Puerto Canyon, 7♂ 1♀, v (AM), adult assoc. (Shields #191). *Eriogonum parvifolium* Sm. in Rees. var. *paynei* (Wolf ex Munz) Reveal in Munz. CALIFORNIA: Ventura Co.: 12.1 rd. mi. E of jct. Hwy. 33 & 150, 1000', 6.1 rd. mi. NW of jct. Hwy. 150 & 126 (N of Santa Paula along Hwy. 150), 17♂ 8♀, vi (AM), adult assoc. (Shields #96).

Ssp. *tildeni* is on wing from mid May to mid September.

In Del Puerto Canyon, Stanislaus Co., California, *tildeni* uses the annual *E. covilleanum* in May when *E. nudum* is just sprouting new growth for the year, then in July to September another flight uses *E. nudum* blooms. Specimens from the different flights are nearly indistinguishable in appearance, although these may represent two reproductively isolated, single-brooded populations. The population on *E. parvifolium* var. *paynei* near Santa Paula, Ventura Co., is intermediate between *tildeni* and *smithi*.

E. parvifolium var. *paynei* is endemic to Santa Paula Canyon, Ventura Co., California. *E. covilleanum* occurs from Alameda and western Stanislaus cos. southward to Fresno and Kern cos., California (endemic), flowering from April to June.

Shijimiaeoides enoptes smithi (Mattoni, 1954)

Mattoni. 1954. *Bull. S. Calif. Acad. Sci.* 1954, vol. 53, pp. 160-162 & 165, pl. 43, ff. 8-9.

The holotype male comes from Burns Creek, State Highway 1, Monterey Co., California, VIII-20-48 (C. I. Smith & R. H. T. Mattoni). Ssp. *smithi* is distinguishable from its nearest subspecies in geographic proximity, *e. bayensis* and *e. tildeni*, by its distinctive underside. Mattoni (1954) lists five characters that in combination distinguish *smithi* from other subspecies. He thought that its fall flight (actually late summer) and gross appearance suggest that it is closely related to *enoptes dammersi*. However, in average teeth number on the valve it differs from *dammersi* and is closer to *enoptes tildeni*; also there is an intermediate population between the two near Santa Paula. (Ssp. *dammersi* appears to be more closely related to *enoptes mojave* and *enoptes langstoni* than to *enoptes enoptes*.) Distribution records for *smithi* are given in Mattoni (1954) and Langston (1963). Ssp. *smithi* is known only from Monterey Co., chiefly along the coast. Mattoni (1954) figures the upper and lower surface of a male *smithi* in black-and-white. Langston (1963), after making genitalic preparations from various localities within its range, noted that Mattoni was correct in placing *smithi* as a subspecies of *enoptes*.

Number of teeth on terminal end (cucullus) of valve = 13 (1), 14 (1), 15 (2), 16 (3), 17 (6), 18 (7), 19 (2), 20 (4), 21 (3); N = 29, average = 17-18, all from Seaside.

DISTRIBUTION (viewed 45♂ gen. from 6 localities): CALIFORNIA: Monterey Co.: 36 mi. S Big Sur, 6♂ 4♀, vii (GG); Burns Creek, 1♂, viii (KH); ½ mi. N Dolans Creek, 1♂, viii (CIS); 3 mi. S Lucia, 150', 1♂ 1♀, viii (LACM, CIS); 9 mi. NW Lucia, 1♂, viii (CIS); Marina Beach (dunes), 2♀, viii (CIS); Monterey, 10♂ 10♀, vi-viii (CAS); Seaside, 18♂ 22♀, vii (CIS, KH, PO).

HOSTS: *Eriogonum parvifolium* Sm. in Rees var. *parvifolium*. CALIFORNIA: Monterey Co.: dunes at NW end Olympia Ave., ca. 25', Seaside, 67♂ 47♀, viii (AM), adult assoc. (Shields #133). *Eriogonum latifolium* Sm. in Rees. CALIFORNIA: Monterey Co.: dunes W of Marina, 32♂ 20♀, vi (J. Emmel), oviposition (J. F. Emmel #366), no *E. parvifolium* in the immediate area.

Ssp. *smithi* flies from June to late August.

Bruce Walsh (*in litt.*) found a *smithi* colony at Vasquez Knob, 1600-1800', Carmel Valley, Monterey Co., in association with *E. parvifolium*; one oviposition was observed.

Shijimiaeoides enoptes bayensis (Langston, 1963)

Langston. 1963 [1964]. *Jour. Lepid. Soc.* 1963, vol. 17, pp. 208-212; f. 2; f. 5, nos. c-d.

The holotype male was taken at China Camp, near Point San Pedro, Marin Co., California, VI-17-61 (R. L. Langston). Langston described *bayensis* from 237 specimens at ten localities. At best, it is a weakly-defined subspecies closely allied to *enoptes tildeni* although both have significantly different averages in valve teeth numbers. Langston adequately pictures *bayensis* in black-and-white, figures a drawing of the male genitalia, and gives distribution records. Langston & Comstock (1966) give a life history description of *bayensis*, unusually rich in ecological details, including the fact that the larvae would not feed on substitute species of *Eriogonum* furnished them. They note that the foodplant in Solano and Contra Costa counties is *Eriogonum latifolium* ssp. *auriculatum* (now placed by Reveal as *E. nudum* Dougl. ex Benth. var. *auriculatum* (Benth.) Tracey ex Jeps.). Early records of "Lycaena *enoptes*" from the hills near Mission Dolores, San Bruno Hills, and Lone Mountain in the San Francisco region (Williams, 1910, p. 39) are perhaps referable to this subspecies.

Number of teeth on terminal end (cucullus) of valve = 17 (1), 19 (5), 20 (2), 21 (2), 23 (4), 24 (1); N = 15, average = 20-21, all from Pt. Richmond.

DISTRIBUTION (viewed 17 ♂ gen. from 1 locality): CALIFORNIA: Contra Costa Co.: Point Richmond, 36 ♂ 12 ♀, v, vi, (GG, PO, KH). Humboldt Co.: Fruitland, 7 ♂ 14 ♀, vi (CIS, CAS). Sonoma Co.: 2 mi. N Camp Meeker, 1 ♀, vii (CIS). (Langston, 1970, lists a record for Benicia State Park, Solano Co., vi.)

HOST: *Eriogonum nudum* Dougl. ex Benth. var. *nudum*. CALIFORNIA: Sonoma Co.: several miles N & E of Duncan Mills (fide La Due) (*Shields* #185).

Ssp. *bayensis* flies from mid May to mid July.

Specimens from Fruitland, Humboldt Co., California, determined as *bayensis* by Langston, show some tendency toward northern California populations of *enoptes enoptes*. A close relative of *bayensis* is no doubt *tildeni*, which is often similar on the underside to the *bayensis* population from Point Richmond.

Ssp. *bayensis* is probably closely related to *tildeni* but does resemble *columbiae* in general appearance. In northwestern

California there may be some gene flow in facies towards *enoptes* *enoptes* as well. It is noteworthy that *smithi* and *bayensis* show no intergradation.

E. nudum var. *nudum* is found from southern Washington southward along the coast to near San Francisco and in the mountains from Washington through Oregon to western Nevada and in California to Tulare Co., flowering from June to September.

Shijimiaeoides enoptes columbiae (Mattoni, 1954)

Mattoni. 1954. *Bull. S. Calif. Acad. Sci.* 1954, vol. 53, pp. 162-164 & 165, pl. 43, ff. 7 & 11.

The holotype male comes from the Columbia River near Brewster, Okanogan Co., Washington, V-5-47 (D. Frechin). As Mattoni pointed out, it is closely related to *enoptes ancilla* (although readily distinguishable from it in most populations). Ssp. *columbiae* is found in extreme northern Oregon and eastern Washington, while *ancilla* occurs in western Colorado to western Nevada, northward to western Wyoming, extreme western Montana, and extreme southcentral Idaho. (Mattoni noted that a subspecies of *battoides* was sympatric with *columbiae* and was nearly indistinguishable until genitalic separations were made. He said, "This *battoides* form appears close to *P. battoides glaucon*.") Mattoni (1954) made some genitalic dissections of the type series and noted that *columbiae* was a geographic race of *enoptes*, distinguishable from other *enoptes* subspecies by a combination of six characters. He adequately illustrates the upper and lower surface of males from the type series, in black-and-white.

Number of teeth on terminal end (cucullus) of valve = 13 (3), 14 (2), 15 (1), 16 (1), 17 (1); N = 8, average = 13-14, all from Kusshi Creek, Washington.

DISTRIBUTION (viewed 51 ♂ gen. from 26 localities): OREGON: *Baker Co.*: Snake River Canyon, 8-9 mi. N Huntington, 4 ♂ 2 ♀, v (DB). *Jefferson Co.*: Metolius River, N of Lower Bridge Cmp., 1 ♂ 2 ♀, vi (DM). *Linn Co.*: Santiam Pass, 1 ♀, vi (KH). *Umatilla Co.*: Mill Creek nr. Kooskooskie, Wash., 26 ♂, vi (DB). *Wasco Co.*: 6.3-6.5 mi. SW The Dalles, 1750-1800', 17 ♂ 7 ♀, v (AM); 7.3 mi. SW The Dalles, 1850', 1 ♂, v (AM); Juniper Flat, 10 mi. W Maupin, 1890', 2 ♂, v (AM); 1.7 mi. SW Rowena, 525', 1 ♂, v (AM). *Yamhill Co.*: McMinnville, 4 ♂, vi (LACM). WASHINGTON: *Douglas Co.*: Rock Isl. Dam, 4 ♂ 3 ♀, v (DM). *Kittitas Co.*: 3 mi. W Cle Elum, 1 ♂ 1 ♀, vii

(CIS); Easton, 1 ♂ (CAS). *Klickitat Co.*: Kusshi Creek, 32 ♂, vi (DB); Satus Creek, 5 ♂ 5 ♀, v (DB); Satus Pass, 3200-3500', 4 ♂ 3 ♀ v-vii (CIS, AM); Satus Pass Hwy., 4 mi. N Kusshie Creek, 2 ♂ 1 ♀, v (DM); Satus Pass Ski Area, 1 ♀, vi (LACM). *Okanogan Co.*: Brewster, 4 ♂ 7 ♀, v (LACM, CM, YU); Black Canyon, nr. Brewster, 2 ♂, v (LACM); Pateros, 2 ♂ 2 ♀, vi (YU). *Yakima Co.*: Ahtanum Creek, 1800-2200', 10 ♂ 11 ♀, v (CIS, JS, PO, KH); Bear Canyon off White Pass Hwy., 3000-3200', 10 ♂ 5 ♀, v-vii (JS, PO, CIS, AM, DM); Cottonwood Creek, 2000', 1 ♂ 1 ♀, vi (CIS); Cowiche Crk. Rr., 1 ♀, vii (DM); Harwood, 1 ♂, vi (DM); Kusshi Crk., 2000-3000', 3 ♂ 4 ♀, v, vi (AM); Kussler Crk., 2200', 1 ♂, v (CIS); Mill Creek, 1500-1600', 9 ♂ 2 ♀, iv, v (KH, JS, CIS, MF); Oak Creek off White Pass Hwy., 3000-3500', 3 ♂ 1 ♀, v-vii (DM, PO, CIS); Satus Pass Hwy., ca. 15 mi. S Topp, 1 ♂ 2 ♀, v (DM); N of Satus Pass, 1 ♀, v (LACM); 2 mi. W Tieton, 1 ♂, vii (DM); White Pass Hwy. 8 mi. E Tieton Ranger St., 1 ♂ 1 ♀, vii (DM). *County undetermined*: "E. of G. Dalles", 1 ♂, v (CAS).

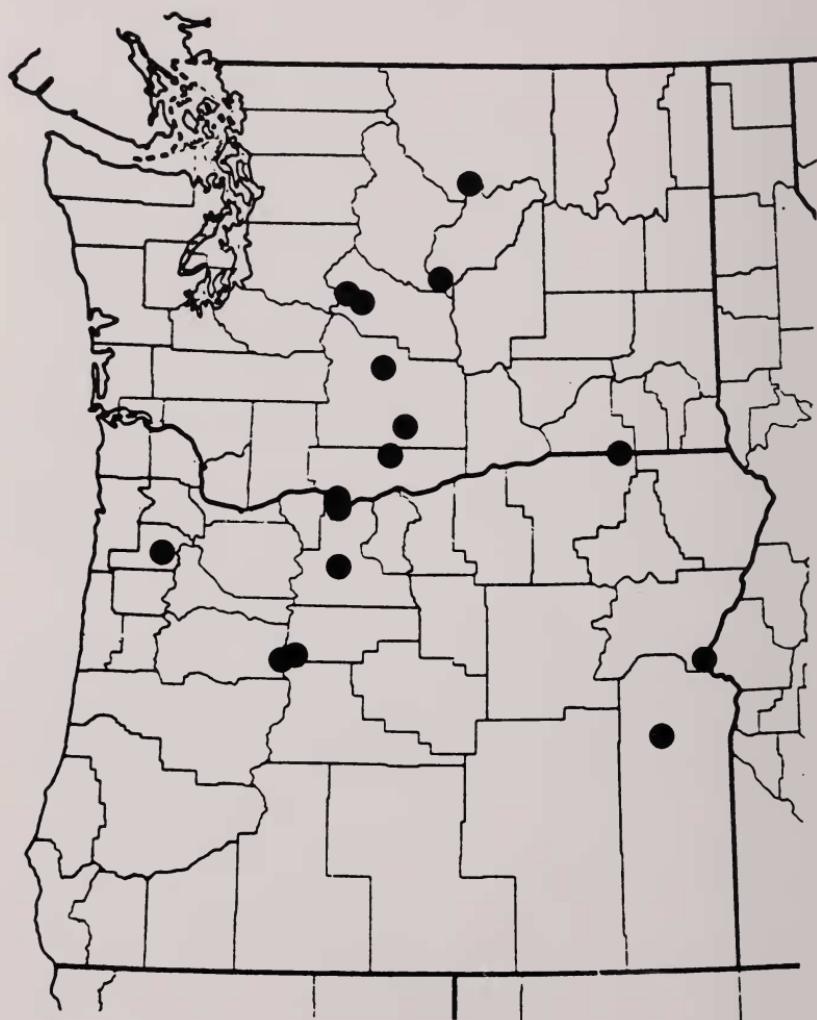
HOST: *Eriogonum compositum* Dougl. ex Benth. in Lindl. var. *compositum*. **OREGON:** *Malheur Co.*: Simmons Gulch at Malheur River, 23 rd. mi. E Juntura, 2 ♂ 2 ♀, v (AM), adult assoc. (D. P. Levin, s. n.). See Map 5.

Ssp. *Columbiae* flies from late April to mid July.

The female of an *in copula* pair of *enoptes* taken 8 mi. E of Tieton Ranger Station, Yakima Co., Washington, is like *columbiae* but the male is similar to *enoptes enoptes*. One male *enoptes* (Fig. 12, 13), similar to *enoptes enoptes* on the underside but otherwise close to *columbiae*, was taken at Tumwater Canyon, Chelan Co., Washington, V-29-57 (D. L. Bauer, DB).

Although *columbiae* is so far known only from one location on *E. compositum*, the closely related *ancilla* uses *E. heracleoides*, and *battoides glaucon* in the vicinity of Brewster, Washington, an area of sympatry with *columbiae*, uses *E. heracleoides* var. *angustifolium*. The range of var. *angustifolium* corresponds to the range of *columbiae* and thus may be its principal foodplant.

E. compositum var. *compositum* is found in southern Washington and western Washington from Mt. Rainier southward to California as far as Lake Co., flowering from April to July. *E. heracleoides* var. *angustifolium* ranges along the Columbia River drainage in northern Oregon northward to northeastern Washington and southern British Columbia and eastward into central Idaho where it is local and sporadic, flowering from



Map 5.—Distribution of *S. enoptes columbiae*.

May to July.

Shijimiaeoides battoides glaucon (Edwards, 1871)

(See discussion of *spaldingi*, in Part IV)

DISTRIBUTION (viewed 110♂ gen. from 72 localities): CALIFORNIA: *Alpine Co.*: Carson Pass, 8573', 1♂, vi (CIS). *El Dorado Co.*: Meyers, 6300', 2♀, vi (DB); Mt. Tallac, 1♀, vii (CIS). *Inyo Co.*: Andrews Camp, Bishop Creek, 3♂ 6♀, vi (LACM); Bishop Creek, 3♂ 3♀, v, vi (LACM); Lone Pine Canyon, 1♂, vii (LACM); Mahogany Flat, 7500-8000', Panamint Mts., 1♂ 1♀, vi (DB). *Modoc Co.*: Buck Creek, 1♂, vi (LACM); Fandango Pass, 6100', Hist. Mon. #546, Warner Mts., 1♀, vi (CIS). *Mono Co.*: Bodie, 2♂, vii (CM); Convict Lake, 1♂, vi (AM); Cottonwood Canyon, 7000', S of Brodie, 5♂ 3♀ + "10", vi (LACM, CIS); Grant Lake, 7 air mi. S Lee Vining, 4♀, vi (CIS); Grant Lake, 7800', 5♂ 2♀, vi, vii (AM); just W of Grant Lake, 3♀, vi (JL); 2.5 mi. above Grant Lake, 7800', 2♂ 4♀, vii (AM); June Lake, 1♂, vi (AM); Lower Rock Creek, 5500', Swall Mead, 1♂ 2♀, v (DB); Lundy, 1♂, vii (CM); Mammoth, 4♂ 1♀, vi, vii (LACM); 4 mi. E Monitor Pass, 2♂, vi (CIS); Mono Lake, 1♂ 2♀, vii (CM, LACM); W shore, Mono Lake, 12♂ 1♀, vi (LACM, AM); Rush Creek, 1♂, vi (LACM); Silver Lake, 1♂, vi (LACM); 1½ mi. SE Tom's Place, 48♂ 6♀, vi (LACM, CIS); Warren Creek, 1♂, vii (LACM). *Placer Co.*: Ward Peak, 8500', 1♀, vii (LACM). *Shasta Co.*: Hat Creek — 3N, 1♂, vi (CIS); Old Station, 1♀, vi (CIS). *Siskiyou Co.*: Mt. Shasta, 7600', 1♀, viii (AM); Pumice Stone Well, 1♂, vii (LACM). *County undetermined*: Glen Alpine, Tahoe, 1♀, vi (CAS). IDAHO: *Ada Co.*: Boise, 4500-7500', 8♂ 12♀, vii (MCZ). *Butte Co.*: nr. Craters of Moon Nat. Mon., 7♂ 4♀, vii (JS); Craters of the Moon Nat. Mon., 4♂, vi (UI). MONTANA: Sula, 4700', 1♂, vi (UI). NEVADA: *Douglas Co.*: Carson Valley, 2♂ 5♀, vi (NSM). *Ormsby Co.*: Carson Range, W Stewart, 1♂ 1♀, vi (DB); Eagle Valley, 9♂ 5♀, v, vi (NSM); Graphite Cyn., 1 mi. W Carson City, 9♂ 9♀, vi (GG); Graphite Cyn., ca. 2 mi. S Carson City, 7♂ 5♀, vi (JS, PO); Kingston Cyn., 5500', 2♂ 8♀, vi (PO); Lakeview Hill, 12♂ 6♀, vi (LACM); Voitaire Cyn., 5200', 5♂ 6♀, vi (DB). *Storey Co.*: Ophir Grade, 11♂ 5♀, vi (NSM); Virginia City, 7 mi. Canyon, 5♂ 2♀, v (DB). *Washoe Co.*: Nellie Spgs., S. R. 34, 5♂ 2♀, v (NSM); Reno, 1♂ 1♀, vii (CM); Reno,

N City Limit 395, 2♂ 3♀, v (DB); 2 mi. N Reno, 5♂, vi (GG, PO). *Nevada-Idaho border*: N of Jarbridge on Nev.-Ida. border, 2♂, vi (CIS). OREGON: *Baker Co.*: Baker, 2♂, vii (CM); Durkee, 2♂, viii (CM); along rd. between Joseph & Hwy. 86, 13.2 rd. mi. N of jct. with Hwy. 86, Duck Creek, at turnoff to Fish Lake, 2♂, vii (AM). *Clackamas Co.*: Mt. Hood, 1♂ 2♀, vii (MCZ). *Gilliam Co.*: 4.5 mi. S Condon, 2500', 3♂ 7♀, vi (AM); 5 mi. NE Lonerock, 3♂, vi (DB). *Grant Co.*: 1 mi. S Senaca along Silvies River, 5000', 1♂, vii (CIS). *Harney Co.*: ½ mi. W Burns P.O., 4100', 1♂, v (CIS); Cricket Creek, 13 air mi. NW Burns, 4900', 1♂, vii (CIS); Devine Canyon, 12 mi. N Burns, 5000', 1♂, vii (CIS); Roaring Springs, 4600', 1♂, vi (CIS). *Jackson Co.*: Mt. Ashland Loop Rd., 1♂, vii (CIS). *Klamath Co.*: Bly Mt., 5000', 2♂, vi (CIS); 1.6 mi. E Hwy. 97, 9 mi. N Kirk, 4650', 1♂, vii (AM). *Lake Co.*: Drake Peak, Warner Mts., 1♀, vii (AM). *Morrow Co.*: 2-4 mi. S Hardman, 1♂ 1♀, vi (DB). *Umatilla Co.*: 12 mi N Ukiah, Carney Bu. L. O. rd. & Hwy. 395, 14♂, vi (DM). *Wasco Co.*: 11.2 mi. SW The Dalles, 1750', 6♂ 8♀, v (AM); Juniper Flat, 10 mi. W Maupin, 1890', 24♂ 21♀, v, vi (AM); 2 mi. NNW Mill Crk. bridge, Warm Springs Indian Res., 2500', 1♂ 2♀, vi (AM); 2 mi. SE Tygh Valley, Hwy. 197, 1400', 16♂ 28♀, vi (AM). *Wheeler Co.*: Mountain Creek, 6 mi. E Mitchell, 2♂ 1♀, vii (AM). WASHINGTON: *Adams Co.*: 5 mi. SW Sprague, 1♂, vi (PO). *Chelan Co.*: Cashmere, 3♂ 3♀, v (DB); nr. Drury, 2♂, vi (DB); First Crator, 1♂, vi (CM); Leavenworth, 1♂, v (DB); Tumwater Canyon, 1♂, v (DB). *Grant Co.*: Beverly, 3♂ 1♀, v (DM). *Kittitas Co.*: Easton, 3♀ (CAS); 3 mi. W Vantage, 2♂, v (DM); Wenas Crk. Rd., 10 mi. SW Ellensburg, 3♂, v (DM); Wymer, 2♂, v (DB). *Okanogan Co.*: Alta Lake, 1♂, vi (AM); Alta Lake St. Pk., 1♂ 2♀, v (DM); Brewster, 20♂ 11♀, v, vi (YU, PO, AM, LACM); Pateros, 2♂ 1♀, v (CM, CAS); Similkameen River, 1♂ 1♀, vi (CIS). *Yakima Co.*: Satus Pass Hwy., ca. 15 mi. S Topp, 2♂, v (DM); Wenas Crk., 2400', 1♂, vi (PO). *County undetermined*: Priest Rapids, 400', 2♂, vi (LACM). BRITISH COLUMBIA: Garnett Valley, Summerland, 3♂, vi (LACM); Oliver, 1♂, vi (LACM); 2 mi. N Princeton, 4♂ 4♀, vi (KH, JL, LACM); Shingle Cr. Road, Keremeos, 2♂, vi (LACM).

HOSTS: *Eriogonum umbellatum* Torr. var. *nevadense* Gand. CALIFORNIA: *Mono Co.*: Cottonwood Canyon, 8200-8300', 2 mi. S Bodie, 4♂, vii (AM), oviposition (*Shields* #6); peak slope ca. 1 mi. W Hwy. 395 on Hwy. 89, SW of Topaz Lake,

PLATE 1

Fig. 1.—*Shijimiaeoides rita*, unnamed ssp., ♀ upperside, Uinta Canyon, Duchesne Co., Utah, VIII-4-59 (J. C. Downey).

Fig. 2.—Same, underside.

Fig. 3.—*S. enoptes* nr. *ancilla*, ♂ upperside, Mt. Charleston at 7200', Clark Co., Nev., VI-26-59 (J. C. Downey).

Fig. 4.—Same, underside.

Fig. 5.—*S. enoptes* nr. *enoptes*, ♂ upperside, Kyle Canyon, 7100', Mt. Charleston, Clark Co., Nev., VII-14-66 (P. H. Arnaud, Jr., CAS).

Fig. 6.—Same, underside.

Fig. 7.—*S. enoptes* nr. *enoptes*, So. Cal. population, ♂ upperside, Blackburn Canyon, Tehachapi Mts., Kern Co., Calif., VII-10-64 (N. La Due).

Fig. 8.—Same, underside.

Fig. 9.—Same, ♀ upperside, So. Fk. Campgrd., So. Fork Big Rock Crk., San Gabriel Mts., Los Angeles Co., Calif., IX-9-66 (J. Lane).

Fig. 10.—Same, underside.

Fig. 11.—*S. enoptes*, unnamed ssp., ♂ underside, Hemet Ridge, 6000', San Jacinto Mts., Riverside Co., Calif., V-24-08 (F. Grinnell, Jr., LACM).

Fig. 12.—*S. enoptes* nr. *columbiae*, with underside similar to *enoptes enoptes*, ♂ upperside, Tumwater Canyon, Chelan Co., Wash., V-29-57 (D. L. Bauer).

Fig. 13.—Same, underside.

Fig. 14.—*S. battooides* nr. *glaucous*, ♂ underside, Uncompahgre Plateau, 8400', near 25 Mesa Ranger Station, Montrose Co., Colo., VI-22-62 (K. B. Tidwell).

Fig. 15.—*S. battooides* nr. *glaucous* (?), ♂ underside, Telescope Mt., Inyo Co., Calif., VII-9-37 (LACM).

PLATE 2

Fig. 16.—Same, ♀ underside.

Fig. 17.—*S. battooides* near *ellisi*, ♂ underside, Kingston Canyon, Toiyabe Range, Lander Co., Nev., VII-22,23-64 (J. Lane, LACM).

Fig. 18.—*S. battooides* unnamed ssp., ♂ upperside, Hwy. 89A, 8 mi. ESE of Fredonia, Coconino Co., Ariz., V-18-68 (K. Roever & R. Funk).

Fig. 19.—Same underside.

Fig. 20.—Same, ♀ upperside.

Fig. 21.—Same, underside.

Fig. 22.—*S. battooides glaucous* X *enoptes ancilla* hybrid by genitalia, ♂ upperside, Pattee Canyon, 3500', Missoula Co., Montana, VI-23-62 (J. Scott).

Fig. 23.—Same, underside.

Fig. 24.—*S. enoptes ancilla*, ♀ gynandromorph, Sybille Canyon, 6500', Albany Co., Wyo., VII-4-66 (R. Hardesty).

Fig. 25.—*S. enoptes dammersi*, ♀ underside, unusual aberrant, Hualapai Mts., Mojave Co., Ariz., IX-4-58 (K. Hughes).

Fig. 26.—*S. battooides* nr. *allyni*, ♂ somewhat aberrant, Cedros Island, Mexico, III-18-39 (CAS).

Fig. 27.—*S. battooides* nr. *glaucous*, ♀ aberration, Mt. Hood, Ore., VII-20-37 (CM).

Fig. 28.—*S. battooides glaucous*, ♀ aurora aberrant, 2 mi. NNW Mill Cr. bridge, Warm Spgs. Indian Res., 2500', Wasco Co., Ore., VI-18-66 (B. & S. Perkins, AM).

Fig. 29.—Habitat of *S. rita pallescens* 8 mi. S of Currant, W. slope Grant Range, Nye Co., Nev., with *Eriogonum kearneyi* var. *kearneyi* in foreground.

Fig. 30.—Habitat of *S. battooides martini* 3 mi. SW Beatty, Nye Co., Nev., with *Eriogonum fasciculatum* var. *polifolium* in foreground.



Plate 1

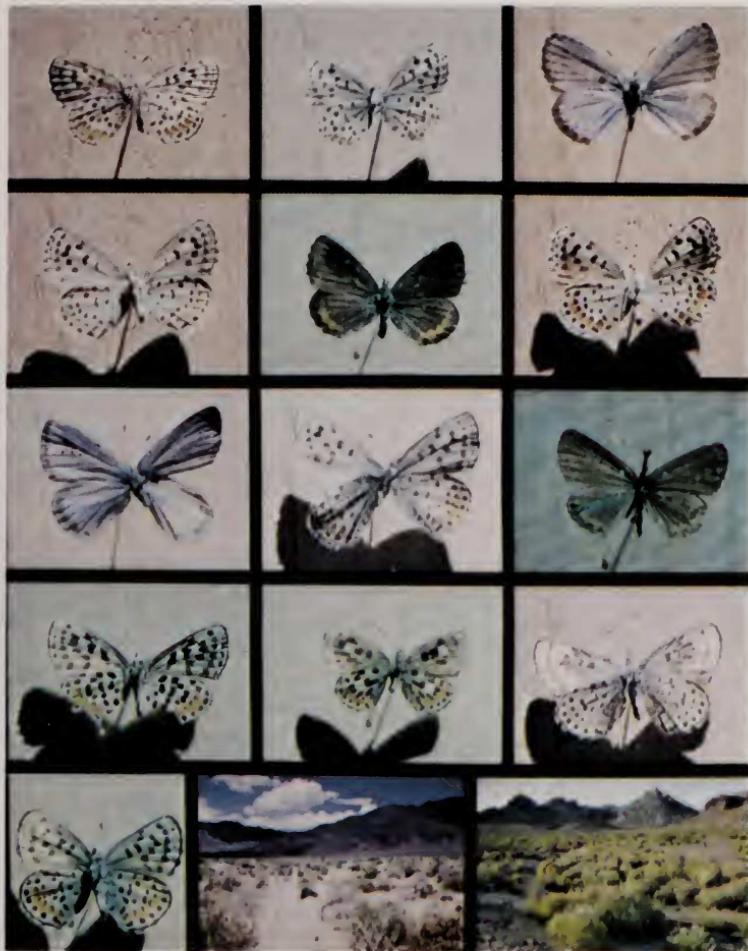


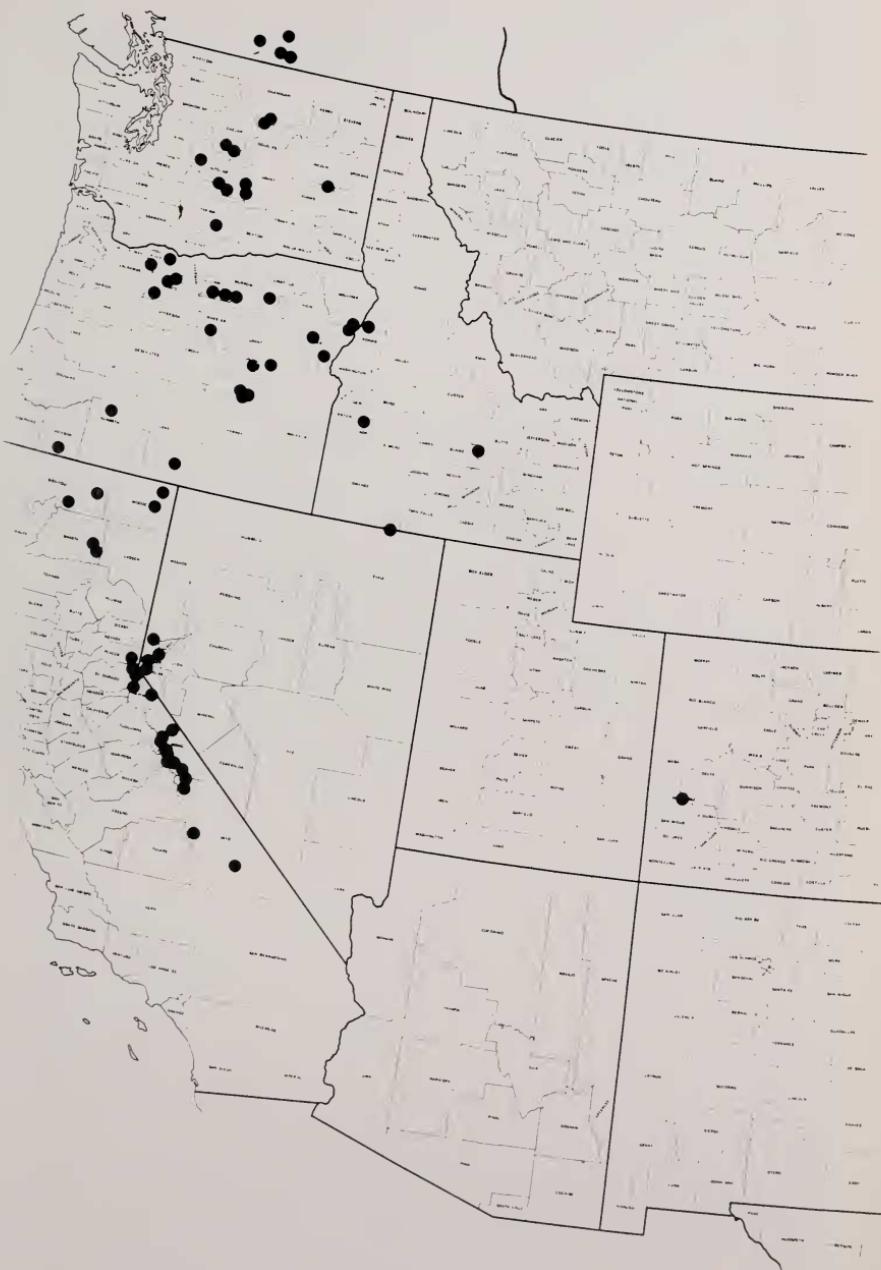
Plate 2

vi (AM), adult assoc. (*Shields* #197); Warren Creek, 9000', vii (OS), adult assoc. (*Shields* #250). *Eriogonum umbellatum* Torr. var. *chlorothamnus* Reveal. CALIFORNIA: Mono Co.: 1.6 rd. mi. N Mono-Inyo Co. line, along Hwy. 395, ca. 6 rd. mi. SE Sherwin Summit, ca. 5700', 1 ♂, v (AM), adult assoc. (*Shields* #82). *Eriogonum umbellatum* Torr. var. *stellatum* (Benth.) M. E. Jones. OREGON: Grant Co.: 5.0 rd. mi. WSW jct. Rd. 162 & Rd. 1427, along Rd. 162, T16S, R33½E, E of Seneca, 1 ♂, vii (AM), adult assoc. (*Shields* #112). Wallowa Co.: along rd. between Joseph & Hwy. 86, 17.8 rd. mi. N jct. with Hwy. 86, 1.2 rd. mi. SW Wallowa Mtn. summit, 1 ♂ 1 ♀, vii (AM), adult assoc. (*Shields* #116). *Eriogonum heracleoides* Nutt. var. *heracleoides*. IDAHO: Adams Co.: Seven Devils Campground Rd., 5 mi. W Hwy. 95, Payette Nat'l For., 4500', 1 ♂ 2 ♀, vii (AM), adult assoc. (*Ellis* #2000). OREGON: Grant Co.: Summit Prairie, at jct. of Rd. 162 & Rd. 1427, T16S, R34E, Malheur Nat'l For., SE of Prairie City, 1 ♂, vii (AM), oviposition (*Shields* #111). *Eriogonum heracleoides* Nutt. var. *angustifolium* (Nutt.) Torr. & Gray. WASHINGTON: Okanogan Co.: 4 mi. E Brewster, 10 ♂ 19 ♀, v (AM), adult assoc. (J. A. Justice, s. n.). *Eriogonum sphaerocephalum* Dougl. ex. Benth. var. *halimoides* (Gand.) S. Stokes. CALIFORNIA: Modoc Co.: 3.0 rd. mi. NE of jct. Hwy. 395 & 299, along Hwy. 299, Warner Mts., "10", vii (AM), oviposition (*Shields* #103). *Eriogonum flavum* Nutt. in Fras. var. *piperi* (Greene) M. E. Jones. IDAHO: Adams Co.: Summit of Heaven's Gate, 7 Devils Range, 8407', Payette Nat'l For., 1 ♀, vii (AM), adult assoc. (*Ellis* #2001). See Map 6.

Ssp. *glaucum* is on wing from early May to mid August. Populations are variable, and distinct segregates may exist.

Ssp. *battoides* *glaucum* and *enoptes columbiae* are sympatric at Juniper Flat, Wasco Co., Oregon; Tumwater Cyn., Chelan Co., and Brewster, Okanogan Co., Washington; and have similar facies at Pateros, Okanogan Co., Washington. One male near Kirk, Klamath Co., Oregon, has an upperside as dark as *battoides oregonensis* but an underside like *glaucum*. A female from Fandango Pass, Modoc Co., California, is intermediate between *glaucum* and *intermedia*; *enoptes enoptes* is sympatric there. A ssp. near *glaucum* is sympatric with *enoptes langstoni* near Sherwin Summit, Mono Co., California. Specimens of *glaucum* from Mt. Ashland, Jackson Co., Oregon, are atypical.

A singleton male (gen. det.) from Uncompahgre Plateau, 8400', near 25 Mesa Ranger Station, Montrose Co., Colorado,

Map 6.—Distribution of *S. battoides glaucon*.

VI-22-62 (KT) is unusual in that it is closer to *glaucon* than to *centralis* or *ellisi* in facies and represents a considerable eastward range extension (See Fig. 14). However, the specimen is not typical *glaucon*.

Female *glaucon* from Bishop Creek, Inyo Co., and Grant Lake, Mono Co., have some basal blue on the dorsal surface, lacking in other *glaucon* populations.

Eriogonum umbellatum var. *stellatum* extends from southeastern Washington and northern Idaho into northern Utah southward to Del Norte, Siskiyou, and Trinity cos., California and along the western flank of the Sierra Nevada to Kern Co., flowering from July to September. Var. *chlorothamnus* is known from southern Mono Co. s. along the e. side of the Sierra Nevada to s. Inyo Co., California, flowering from late June to September. *E. heracleoides* var. *angustifolium* ranges along the Columbia River drainage in northern Oregon northward to northeastern Washington and southern British Columbia and eastward into central Idaho where it is local and sporadic, flowering from May to July. *E. sphaerocaphalum* var. *halimoides* is found in central and eastern Oregon south to northern California and northwestern Nevada, then eastward into southwestern Idaho, flowering from May to July. *E. flavum* var. *piperi* occurs mainly (but not always) west of the Continental Divide, from south-western Alberta, western Montana, and northwestern Wyoming westward across northern and central Idaho to northeastern Oregon and eastern Washington and southern British Columbia, flowering from June to August.

Shijimiaeoides battoides battoides (Behr, 1867)

(See discussion in Part IV)

DISTRIBUTION (viewed 28♂ gen. from 16 localities): CALIFORNIA: Fresno Co.: Bullfrog Lake, 10,634', 1♂, viii (LACM); Cartridge Creek Basin, 1♂, vii (CIS); Huntington Lake, 4♂ 3♀, vi, vii (LACM); Kaiser Crest, 14♂ 3♀, vi, vii (AM, LACM, KH); Kaiser Crest, 10,000', 7♂ 9♀, vi, vii (KH); Kaiser Pass, 9800-10,100', 5♂ 2♀, vii (AM, YU); South Fork, Cartridge Creek, 1♂, vii (CIS); Windy Ridge, 1♂, vii (CIS). Inyo Co.: Lone Pine Lake, 8500', 4♂, vi (CIS); vic. Mono Pass, 11,500-12,500', 17♂ 27♀ + "4", viii, ix (PO, CIS, CAS, MCZ, JS, AM); above Ruby Lake, 2♂ 2♀, viii, ix (CIS); Whitney Trail, 9000', 2♂, vii (CIS). Madera Co.: Minaret Ridge, 9265' 1♂ 4♀, viii (AM). Mono Co.: Bud Lake, 1♂, vii (LACM);

W end Dana Plateau, NE Tioga Pass, 11,000-11,400', 1♂, viii (AM); McLeod Lake, 1♀, vii (AM); Mammoth, 10♂ 3♀, vii (LACM); Mammoth Camp, 7♂ 3♀, vii (LACM); Mammoth Crest, 13♂ 10♀, viii (CIS, CAS); Mammoth Lakes, 3♂ 1♀ + "10", vii, viii (LACM, CIS, CAS, YU); Minaret Summit, Mammoth Lakes, 7♂ 5♀, vii (CIS, LACM, AM); Pilot Knob nr. Tioga Pass, 1♂, viii (JL); Rock Creek, 2♂, viii (LACM); Tioga Pass, 2♂ 2♀, vii, viii (CAS, CIS, LACM); 4.9 mi. E Tioga Pass, 9400', 1♀, vii (AM); E end Tioga Pass, 10,000', 1♂, vii (AM); W above Tioga Pass, 6♂ 8♀, vi-viii (LACM, CIS); Virginia Lakes, 1♂, vii (LACM); Walker River (error?), 4♂, vii (LACM). *Sierra Co.:* Gold Lake, 2♂ 4♀, vii (CM). *Tulare Co.:* Mineral King, 10,500-11,000', 4♂ 4♀, vii (LACM, CAS, CM); Monarch Lake, 10,000', 1♂, vii (CM). *Tuolumne Co.:* Cockscomb Pk., Yosemite Nat'l Park, 2♂ 2♂, vii (LACM); Helen Lake, Yosemite, 1♀, vii (LACM); May Lake trail, Yosemite, 1♀, vii (PO); Mt. Hoffman, Yosemite, 1♀, vii (LACM); Sonora Peak, 1♂, viii (CIS); Tuolumne Meadows, 1♂ 2♀, vii (LACM); N & NW above Upper Gaylor Lake, 10,600-11,000', NW Tioga Pass, 1♂ 1♀, viii (AM); Vogelsang Pass, 1♀, viii (LACM). *County undetermined:* Boundary Hill, Yosemite, 1♀, vii (CIS). Some additional records appear in Eriksen (1962). In mid-August 1963 I took it commonly in French Canyon (Star Lake, Steelhead Lake, 11,700-11,800') and near Wahoo Lakes, 11,500', Fresno Co.

HOSTS: *Eriogonum lobbii* Torr. & Gray var. *lobbii*. CALIFORNIA: *Inyo Co.:* trail between Mono Pass & Ruby Lake, 11,500', viii, 3 larvae in flowerheads (*J. F. Emmel* #109, det. by D. Breedlove). *Eriogonum incanum* Torr. & Gray. In the Yosemite region, reported flying over this species (Garth, 1935); CALIFORNIA: *Mono Co.:* .2 mi. W Mammoth Mtn., 9000', 1♂, vii (OS), adult assoc. (*Shields* #249); crest W. above Tioga Pass, ca. 10,800', vii (OS) adult assoc. (*Shields* #252). *Eriogonum polypodium* Small. CALIFORNIA: *Inyo-Fresno Co. line:* Mono Pass, 12,100', viii, ca. 20 3rd-4th instar larvae in flowerheads (*J. F. Emmel* #108, det. by D. Breedlove). See Map 7.

Ssp. *battoides* is on wing from mid June to September.

Specimens from Kaiser Crest, Fresno Co., are not as boldly square-spotted as they are, e.g., at Mammoth or Tioga Pass, but are closer to *battoides battoides* than to *battoides glaucon*. At Gold Lake, Sierra Co., *battoides battoides* and *battoides intermedia* are sympatric, with no evidence of intergradation. This ssp. is often abundant at high elevations in the Sierra Nevada.



Map 7.—Distribution of *S. battoides battoides*.

E. lobbii var. *lobbii* is widespread in the Coast Ranges from Lake Co. to Siskiyou and Humboldt cos., and in the Sierra Nevada from Plumas Co. southward to Mariposa and Inyo cos., California, and on Mt. Rose and Slide Mountains, Washoe Co., Nevada, flowering from June to August. *E. incanum* ranges in the Sierra Nevada from Tulare and Inyo cos. northward to Tuolumne and Alpine cos., and infrequently to Nevada Co., California, and isolated on Ashland Peak, Jackson Co., Oregon. *E. polypodium* occurs in the southern Sierra Nevada in Tulare, Inyo, and Fresno cos., California (endemic), flowering from July to September.

Shijimiaeoides battooides intermedia (Barnes & McDunnough, 1917)

Barnes & McDunnough. 1917. *Contrib. Nat. Hist. Lepid. N. Amer.*, vol. 3, p. 214, pl. 16, ff. 4-6, p. 262.

This subspecies was originally described from "Shasta Co., Calif. (presumably the vicinity of Castella in the Upper Sacramento Valley) captured in the third week in July." Barnes & McDunnough (1917) regarded *intermedia* as so similar to *enoptes enoptes* in maculation that the two would be inseparable were it not for their striking difference in genitalia. They describe *intermedia* as having the spots on the underside of the secondaries greatly reduced in size, the aurora broken (\pm) into lunules, the terminal dark line reduced to a fine hair-line in width, the black border moderately broad in males, and the fringes of the secondaries white and uncheckered. They picture the "types" adequately in black-and-white. Langston (1969) refers to *intermedia* specimens from Kern and Los Angeles' counties taken 30 to 60 years ago. These are probably the newly described *battrooides comstocki* from Tehachapi, Kern Co., and the typical *intermedia* (possibly erroneous) from Mt. Baldy, Los Angeles County.

DISTRIBUTION (viewed 42 ♂ gen. from 14 localities): CALIFORNIA: *Del Norte Co.*: Little Grayback, NE Del Norte Co., 4600', 6 ♂, vii (CIS); Little Grayback Pass, 21 ♂, vii (CIS). *El Dorado Co.*: Angora Peak, Tahoe, 1 ♀, vii (CIS); Echo Lake, 2 ♂, vii (JS, CIS); N ridge of Echo Lake, 7400-7700', 1 ♂, vii (LACM); Fallen Leaf Lake, 1 ♂ 1 ♀, vi, vii (CAS, LACM); Tamarak L., 2 ♂, vii (CIS). *Nevada Co.*: Bear River nr. Fuller L., 6 ♂ 3 ♀, vii (CIS); Donner Pass, 1 ♂ 1 ♀, vii, viii (CIS); entrance to Lake Spalding, 10 ♂ 7 ♀, vii (AM, CIS). *Placer Co.*:

Cisco, 1 ♂, vii (DB). *Plumas-Sierra Co. line*: Gold Lake, 13 ♂ 19 ♀, vii (KH, AM, LACM, CM). *Sierra Co.*: Salmon Lake Lodge, S Gold Lake, 1 ♀, vii (CIS). *Siskiyou Co.*: Caribou L. & N slope & summit Sawtooth Ridge, Trinity Alps, 6800-7900', 3 ♂, 4 ♀, vii (AM); Castle Lake, 79 ♂ 4 ♀, vi-viii (CIS, CAS, GG, AM, LACM, DB, PO); Castle L., 5600-6000', 7 ♂ 3 ♀, vii (AM); S shore Castle L., 3 ♂ 2 ♀, viii (AM); along E side Castle L., 3 ♂ 2 ♀, vii (AM); N slope of peak S of Castle L., 5600-6400', 1 ♂ 3 ♀, vii (AM); Klamath Lodge, Doggett Creek, 1 ♂, vi (DB); Little Castle Lake, 5300', 2 ♀, vii (CIS, GG); Mt. Shasta, 3 ♂, vii (DB); Mt. Shasta, 7600', 2 ♂, viii (AM); Trinity Alps, Caribou Mt., 6300-7000', 1 ♂, vii (CIS). *Tehama Co.*: rocky outcropping on Lassen Trail Rd., 5300', T27N, R3E, S11, nr. Onion Butte, 10 ♂ 4 ♀, vi (SM). *Trinity Co.*: Carrville, 2 ♂ 1 ♀, vi (CAS, CIS). *Erroneous record* (?): Mt. Baldy, 1 ♂ 1 ♀ (CAS). *OREGON*: *Morrow Co.*: 5 ♂, vii (NSM).

HOST: *Eriogonum marifolium* Torr. & Gray. **CALIFORNIA:** *El Dorado Co.*: along W & SW shore Loon Lake, ca. 15 air mi. N Kyburz, vii (AM), adult assoc. (*Shields* #232). *Siskiyou Co.*: along E side Castle Lake, SW of Mt. Shasta (town), 3 ♂ 2 ♀, vii (AM), adult assoc. (*Shields* #100). *Eriogonum incanum* Torr. & Gray. **CALIFORNIA:** *El Dorado Co.*: NW ridge along NE end of Echo Lake, 7500', vii (OS), adult assoc. (*Shields* #247). See Map 8.

Ssp. *intermedia* flies from early June to early August.

Ssp. *intermedia* in facies sometimes resembles *enoptes* (*e.g.*, Lake Spalding, Gold Lake, Castle Lake, and Onion Butte) and on the underside it sometimes resembles *Plebejus lupini* (*e.g.*, Echo Lake and Loon Lake). Both *P. lupini* and ssp. *intermedia* fly over the same *E. marifolium* flowers at Loon Lake, Echo Lake, and Donner Summit. Thus there is perhaps predation pressure selecting for convergence in undersurface pattern. Both *intermedia* and *oregonensis* use *E. marifolium* and are thus perhaps closely related; indeed, both show some affinity to *glaucum*, their probable common ancestor. Material from Ft. Klamath, Oregon, is intermediate among *glaucum*, *intermedia*, and *oregonensis*. *Eriogonum jamesii*, used by *centralis*, is placed in a section next to *E. marifolium*; both are the most primitive members of their respective sections. Because of this affinity, there may be a relationship between *centralis* and the *intermedia-oregonensis* group. Both *centralis* and *intermedia* on the upper-surface have extensive black borders, and populations from Burns Crk. and Cedar Pass in Modoc Co., California, are nearly

Map 8.—Distribution of *S. battooides intermedia*.

indistinguishable from *centralis*. (*E. jamesii* does not extend to California.)

E. marifolium occurs in the Sierra Nevada from Tuolumne Co. northward to Siskiyou and Modoc cos., California, eastward to the Pine Forest Range of Humboldt Co., Nevada, and northward to central and east-central Oregon, flowering from June to August.

Shijimiaeoides battoides oregonensis (Barnes & McDunnough, 1917)

Barnes & McDunnough. 1917. *Contrib. Nat. Hist. Lepid. N. Amer.*, vol. 3, p. 214, pl. 16, ff. 1-3, p. 262.

Barnes and McDunnough originally described *oregonensis* as a subspecies of *battoides* from Crater Lake, Klamath Co., Oregon, from a long series taken during the last two weeks of July. They merely point out that *oregonensis* compared to *battoides battoides* has a broad black border in males, undersurface spots less quadrate and the ground color a "greener hue", and say that the figures (1-3) on pl. 16 should provide the identification of this subspecies, when compared to *battoides battoides*. Topotypical material I have seen from Crater Lake fits the description and figures, although the underside has a dusky appearance. This is probably a weakly defined subspecies close to *glaucon* and perhaps *intermedia* (see discussions of *glaucon* and *intermedia*), confined to Klamath Co., Oregon. Langston (1969, p. 55) thought that *oregonensis* was a high elevation subspecies in southern Oregon that decreased in altitude with latitude in Washington and British Columbia. However, material I have examined from outside Klamath Co. is *glaucon* (except for one peculiar population from Mt. Hood; see fig. 27).

DISTRIBUTION (viewed 4♂ gen. from 4 different localities): OREGON: *Klamath Co.*: 2 mi. W of jct. 230 & 97, 1♂, vii (JS); Crater Lake, 4♀, vii, viii (LACM, CM); E Rim Crater Lake, 1♂, vii (AM); S entrance Crater Lake Nat'l Park, 1♀, vi (CAS); 2 mi. W Diamond Lake Hwy. & US 97 Jct., 1♀, vi (CIS); Hillman Peak, 7500', Crater Lake Nat'l Park, 1♂, 1♀, vii (AM); 1.6 mi. E Hwy. 97, 9 mi. N Kirk, 4650', 1♀, vii (AM); Miller Creek, 5000', 1♂, 1♀, vi (CIS).

HOST: *Eriogonum marifolium* Torr. & Gray. OREGON: *Klamath Co.*: ca. 5 air mi. NE of Chemult, along rd. to Walker Mtn. Lookout, Walker Rim, "3", vii (AM), adult assoc. (*Shields* #107); .7 mi. SE of jct. Crater Lake N.P. boundary (S) and

Hwy. 62, on Hwy. 62, vii (AM), oviposition (*Shields* #223); 5 rd. mi. NE Sun Pass, on Hwy 232, vii (AM), adult assoc. (*Shields* #225); 6 rd. mi. NE Sun Pass, on Hwy. 232, "11", vii (AM), oviposition (*Shields* #227).

Ssp. *oregonensis* flies from late June to early August.

Shijimiaeoides battoides centralis (Barnes & McDunnough, 1917) Barnes & McDunnough. 1917. *Contrib. Nat. Hist. Lepid. N. Amer.*, vol. 3, pp. 214-215, pl. 16, ff. 7-8, p. 262.

The "types" of *centralis* were taken at Salida, Chaffee Co., Colorado, July 1-7. Barnes and McDunnough (1917) say that *centralis* is distinguished by the broad black borders on the upperside in males, a prominent orange shading at the anal angle of the secondaries, a brown underside with spots larger than *intermedia* and well ringed with white, a continuous aurora, and primaries subterminally with a diffuse smokey shade above the outer angle. It is noteworthy that they felt *centralis* is very similar to *intermedia* otherwise (see discussion under *intermedia*). The ssp. *centralis* male "type" from Salida is clearly illustrated in black-and-white. Scott, Ellis and Eff (1968) report the foodplant of *centralis* as *Eriogonum umbellatum*, but I have found it only in association with *E. jamesii*.

DISTRIBUTION (viewed 74♂ gen. from 41 localities): CALIFORNIA: *Modoc Co.*: nr. Burns Creek Ranger Station, 3♀, vii (LACM); Cedar Pass, 1♂, vi (CIS). COLORADO: *Alamosa Co.*: Great Sand Dunes Nat'l Mon., 2♂, vii (AM). *Chaffee Co.*: Maysville, 6♂, vii (CIS, JS, YU); Poncha Creek, 2♂ 2♀, vii (LACM, JS). *Conejos Co.*: Alamosa Reservoir, 7500', 2♂ 1♀, viii (MF); ½ mi. N of E end of Alamosa Res., 34♂ 19♀, vii (JS); W end Alamosa Res., 49♂ 1♀, vii (GG, JS); Gato Creek, 8250' 2♂ 2♀, vii (JS); Schilling's Spring, 43♂, vii (JS); ½ mi. SE Schilling's Spring, 85♂ 22♀, vii (JS). *Custer Co.*: Ben West Hill, 2♂ 1♀, vii (LACM); Hermit Lake Rd., 9000', W Westcliffe, 2♂, vii (KH); Johnson Gulch, 7700' 3♂ 2♀, vii (JS); ½ mi. W Rosita, 2♂ 1♀, vii (JS); Sand Gulch, 1 mi. SW Greenwood, 3♂, vii (JS); 2 mi. N Silver Cliff, 1♂ 1♀, vii (JS); Welsh Pony Ranch, W of Hardscrabble Creek, 1♂, vii (JS); *Fremont Co.*: Box Canyon, 4♂ 1♀, vii (JS); 1 mi. NE Calcite, 14♂ 4♀, vii (JS, SE, LACM); nr. Cotopaxi, 1♀, viii (MF); 3 mi. SW Cotopaxi, 2♀, viii (JS); 1 mi. W Democratic Mtn., 1♂, viii (JS); Falls Culch, 6♂, vii (LACM, JS); South Fork Falls Gulch, 2♂, viii (JS); Fleming Mtn., 1♂, vii (JS); Hayden Creek Campground, 1♂, viii (JS); ½ mi. E. Hillside Cemetery, 1♂, viii (JS); 2 mi. NE Hillside, 1♂, viii (JS); Kiln

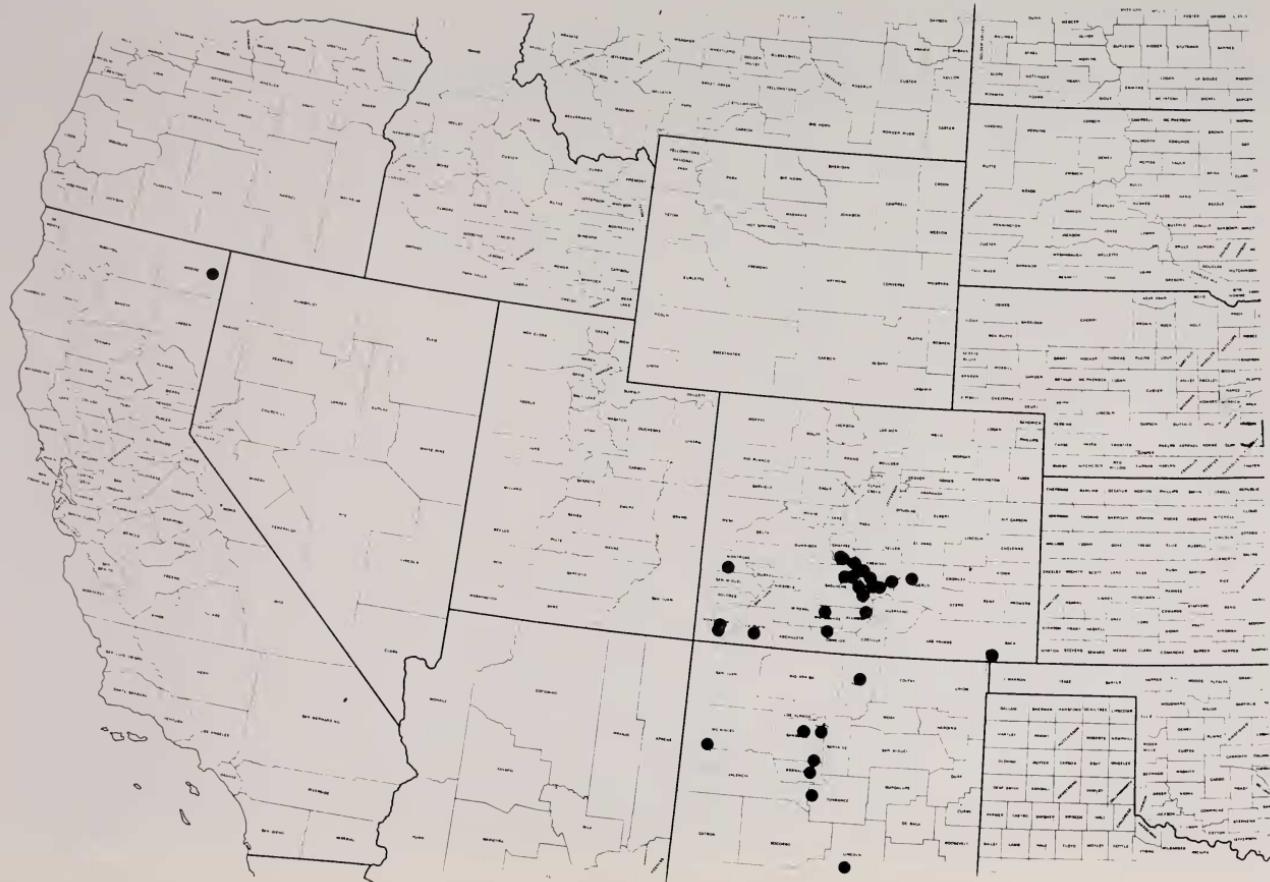
Gulch, 4♂ 1♀, vii (LACM, JS); Kuntz Gulch, 1♂, viii (AM); Oak Creek, nr. Cotopaxi, 6500-7000', 2♂ 1♀, vii (MF); Rouch Gulch, 1♂, vii (JS); Spring Creek, 2♂ 1♀, viii (JS); 1 mi. S Wellsville, 1♀, vii (JS). *La Plata Co.*: 1 mi. S Durango, 7000', 3♂ 2♀, vi (SE). *Montezuma Co.*: Morefield Cyn., Mesa Verde Nat'l Park, 1♀, vii (AM; Wetherill Mesa, Mesa Verde Nat'l Park, 1♀, vii (AM). *Rio Grande Co.*: "D" Hill, Del Norte, 32♂ 4♀, vi-viii (SE, MF). *Saguache Co.*: Cotton Creek, 9000', 11♂, viii (SE); North Crestone Campground, 2♂, viii (SE); Orient Canyon, ESE Villa Grove, 2♂, vii (JS); ca. 5 mi. W Villa Grove, 1♂, vii (JS); 6 mi. W Villa Grove, 11♂ 1♀, vii (JS). *San Miguel Co.*: Hwy. 141, 3.5 mi. S Hwy. 145, 7800', 7♂ 5♀, vi (SE). NEW MEXICO: *Bernalillo Co.*: San Embudido Canyon, SW base Sandia Mts., 14♂, vii (JL, KH). *Lincoln Co.*: 5 mi. N Angus, Hwy. 37, 7050', 1♂, viii (CAS). *McKinley Co.*: 4 mi. S Fort Wingate, 1♂, vii (CAS). *Sandoval Co.*: Frijoles Canyon, Bandelier Nat'l Mon., 1♀, viii (AM); Jemez Spgs., 1♂, vii (CM); ca 1 mi. N Sandia Man Cave, Las Huertas Canyon, S of Placitas, 1♂ 1♀, viii (AM). *Taos Co.*: 4 mi. S Questa, 7800', 1♂, vii (CM). *Torrance Co.*: Capillo Peak summit, 9200', Manzano Mts., 1♂, vii (CM). *County undetermined*: ridge NE of Chupidero Canyon, 9100', Sangre del Cristo Range, 1♂, vii (CM).

HOST: *Eriogonum jamesii* Benth. in DC. var. *jamesii*. COLORADO: *Conejos Co.*: W end Alamosa Reservoir, 49♂ 1♀, vii (GG, JS), adult assoc. (*Shields #141*). *Rio Grande Co.*: "D" Hill, Del Norte, 32♂ 4♀, vi-viii (SE, MF), adult assoc. (*Shields #139*). NEW MEXICO: *Sandoval Co.*: Frijoles Canyon, Bandelier Nat'l Mon., 1♀, viii (AM), adult assoc. (*Shields #147*). See Map 9.

Ssp. *centralis* flies from late June to mid August.

Some *centralis* from San Embudido Canyon, Bernalillo Co., New Mexico, show a likeness to *battroides ellisii* from north-central Arizona in having a narrow aurora and similar markings on the underside. One male from Fort Wingate, N.M., also displays this tendency. Specimens from Hwy. 141, 3.5 mi. S. of Hwy. 145, San Miguel Co., Colorado, are rather atypical *centralis* and parallel *ancilla* on the underside; they are not close to *ellisii*. A singleton female from Alta, Salt Lake Co., Utah, VII-6-43 (MCZ, V. Nabokov) appears to be this phenotype as well.

A long series of *centralis* from Schilling's Spring, Conejos Co., Colorado, is rather similar on the dorsal and ventral surface to *rita coloradensis* which is not sympatric, and differs consider-



Map 9.—Distribution of *S. battooides centralis*.

ably from *rita spaldingi* which is sympatric! Both *centralis* and *spaldingi* are also sympatric at Alamosa Reservoir, Conejos Co. Ssp. *centralis* and *r. coloradensis* are sympatric at Great Sand Dunes Nat'l Mon., Alamosa Co.; Ben West Hill and Silver Cliff, Custer Co.; Hillside, Fremont Co.; "D" Hill, Rio Grande Co.; and Villa Grove, Saguache Co., in Colorado.

Of considerable importance are *centralis* records from Modoc Co., California (Burns Creek and Cedar Pass), a dramatic range extension from the southern Colorado-northern New Mexico stronghold. Specimens from Carrville, Trinity Co., California, are intermediate between *centralis* and *intermedia* on the underside.

An unusual male specimen from Oak Creek, Fremont Co., Colorado, has exceptionally heavy black borders that encompass the outer half of the upperside.

Eriogonum jamesii var. *jamesii* is found from central Arizona, most of New Mexico, and northern Texas, northward into eastern Colorado and western Kansas into southern Wyoming, flowering from June to September.

Shijimiaeoides battoides bernardino (Barnes & McDunnough, 1916)

Barnes & McDunnough. 1916. *Contrib. Nat. Hist. Lepid. N. Amer.*, vol. 3, pp 116-117, pl. 11, ff. 9, 11, 13, p. 152.

The type locality of *bernardino* is Camp Baldy, "San Bernardino Mts." [San Gabriel Mts.], San Bernardino Co., California. Originally described only briefly as "a much smaller race" than *battoides battoides* with paler ground and less heavy markings on the underside, the figures of the type (upper and lower surfaces) definitely establish its identity. The statement, "We have other specimens from San Diego, Pasadena and Havilah," also coincides with the known distribution of *bernardino*. Langston (1965, Map 1) gives a distribution map of *bernardino* in California. This is probably the subspecies referred to as "*Lycaena battoides*" from the Argus Mts. by Riley (1893, p. 244). Comstock and Dammers (1934) give a complete life history description of *bernardino*. They illustrate the last instar and pupa, as do Emmel & Emmel (1973).

DISTRIBUTION (viewed 117♂ gen. from 94 localities): CALIFORNIA: Fresno Co.: Parkfield Grade Rd., 4.5 mi. S Hwy. 198, 1♀, v (AM). Inyo Co.: Argus Mts., 1♂, vi (LACM); Big Pine, 1♂ 2♀, vi (CAS); 4 mi. W Big Pine, 1♀, vi (UCD);

Carroll Crk., 9-11 mi. SW Lone Pine, 5♂, v, vi (CIS); 8 mi. W Lone Pine, 6200', 3♂ 3♀, vii (AM); Surprise Cyn., Panamint Mts., 1♂ 1♀, iv (CIS); Tuttle Crk., 2 mi. SW Lone Pine, 26♂ 8♀, v (CIS); Wyman Creek Canyon, 6800', White Mts., 1♀, vii (AM). *Kern Co.:* Frazier Park, 4♂ 7♀, vi, vii (CIS, GG, KH); 1 mi. W Jct. Frazier Park Rd., & U.S. Hwy. 99, 1♂, vi (KH); Havilah, 14♂ 6♀, vi (AM, CM); Keene, 1♂, vi (CIS); Lebec, 4♂ 1♀, vi (PO, CIS, GG); nr. summit, road up Mesquite Canyon, 3500', El Paso Mts., 1♂ 3♀, v (AM); Mojave, 6♂ 1♀, v (CM); 6 mi. NW Mojave, 1♀, v (CIS); Mt. Pinos, 3♂ 1♀, vi (LACM); 4 mi. N Muroc, 1♂, iv (CIS); Randsburg, 2♂, v (YU); 9 mi. W Randsburg, 1♂, iv (YU); Tehachapi, 1♂ 1♀, vii (CM, LACM); Walker Pass, 4200-5250', 18♂ 4♀, v, vi (DB, LACM). *Los Angeles Co.:* Azusa, 1♂, iii (LACM); 5 mi. N Beverly Hills, Benedict Canyon, 1♀, vi (LACM); Bouquet Canyon, 4♂, vi (LACM, KH); Camp Josepho, Rustic Cyn., 6♂ 3♀, vi (GG); Cobal Crk. Cyn., Padua Hills, 1♂, v (KH); Cold Creek Cyn., Santa Monica Mts., 3♂ 2♀, v (KH); Coldwater Canyon, Santa Monica Mts., 1♂, vi (LACM); Devils Canyon, 5000', 2♂ 3♀, vi (AM); Eaton's Wash, Pasadena, 3♂ 1♀, vi (MCZ, LACM); Encino, 3♂ 5♀, v (UI); Glendale, 5♂ 3♀, v, vi (DB); Glendora, 7♂ 2♀, v, vi (AM, LACM, CAS); Griffith Park, 12♂ 4♀, iv, vi (CAS, CIS, JL, CM); Horse Trail Campground, Angeles Nat. For., 1♀, vi (AM); Lake Hughes, 1♂ 2♀, vi (KH); La Sierra Canyon, 1200', Santa Monica Mts., 1♂, vi (YU); La Tuna Canyon, 61♂ 13♀, v-vii (AM, YU); Littlerock, 1♂ + "4", iv (KH, CIS); 1 mi. W Little Rock, 2♂ 1♀, v (CIS); Long Canyon, 3000', San Gabriel Mts., 1♀, vi (CM); Los Angeles, 12♂ 7♀, vi (CAS, LACM); Malibu Lake, Santa Monica Mts., 2♂ 1♀, v, vi (KH, CIS); Malibu Rd. to Tapia Park, 2♂ 1♀, viii (JL); Mint Canyon, nr. Acton, 2♂ 1♀, v, vi (LACM, CM); Mt. Baldy foothills, 1♂, vi (KH); Mt. Wilson, 1♂, vi (CM); Pacific Palisades, 1♂, vii (CAS); Pallatt Creek, 1♂ 1♀, iv (CIS, AM); Pasadena, 9♂ 3♀, vi, ix (CM, AM, LACM); Pearblossom, 3♂, v (GG); 1.1 road mi. E jct. Pine Canyon Rd. & Ridge Route Rd., just NE Sandberg, 2♂ 3♀, vi (AM); Rancho Santa Ana Botanic Gardens, 1♀, vi (LACM); Ridge Route nr. Whitaker Peak Rd., Tejon Mts., 3♂ 1♀, v (KH); Roscoe, 7♂, v (LACM); San Antonio Canyon, 15♂ 3♀, vi (CAS, CIS); San Antonio Wash, 2♂ 1♀, vii (AM); Sandberg, 2♂ 1♀, vi (KH); 7 mi. NW San Fernando, 1♂, vii (CIS); San Gabriel Canyon, San Gabriel Mts., 2♂ 2♀, v, vi (CAS, AM); West Fork, San Gabriel River,

1 ♂, vi (LACM); San Rafael Hills, Glendale, 1 ♂, vii (DB); Santa Anita Canyon, San Gabriel Mts., 2 ♂, vi (LACM); Santa Monica Mts., 2 ♂ 1 ♀, vi (LACM); Sepulveda Pass, 1 ♂ 1 ♀, vii (KH); Sierra Pelona Rd., Mint Canyon, 2 ♂, vi (AM); Soldiers Home, 2 ♂, vi (CM); Stunt Cyn., Santa Monica Mts., 3 ♀, v (JL); Switzers Camp, 3 ♂ 3 ♀, viii (AM); Switzer's Trail, 3500', San Gabriel Mts., 1 ♂ 1 ♀, vi (LACM); Tanbark Flat, 1 ♂, vii (CIS); Temescal Cyn., Santa Monica Mts., 4 ♂, v (KH); Topanga, 1500', 25 ♂ 22 ♀, v-vii (LACM); Topanga Cyn., 1 ♂ 2 ♀, v (KH); Tujunga, 2 ♂, v (LACM); 2 mi. NW Valyermo, 33 ♂ 23 ♀, v (CIS); 2 mi. E Valyermo, 12 ♂ 3 ♀, v (CIS). *Monterey Co.*: Arroyo Seco, 12 ♂ 4 ♀, v, vi (CIS, CAS, LACM); 6 mi. W Greenfield, 1 ♂, vi (KH); Jamesburg, 1 ♂ 3 ♀, vi (KH). *Orange Co.*: 4 mi. NE Laguna Beach, 1 ♂, vii (CIS); Orange Co. Park, 1 ♂ 1 ♀, vii (LACM). *Riverside Co.*: Aguanga, 3 ♂, vi, vii (CAS); 6 mi. E Anza, 1 ♂ 3 ♀, v (CIS); Chino Canyon, nr. Palm Springs, 1 ♂, iv (AM); Citrus Exp. Sta., 1 ♀, vi (CIS); Corona, 1 ♂, vi (CM); 1 mi. W Cottonwood Spr., Joshua Tree Nat. Mon., 1 ♂, iv (CIS); Dripping Springs, 2 ♀, vi (LACM); Esperanza Rd., SE Cabazon, 1 ♀, v (GG); Garnet Queen Mine, 6000', Santa Rosa Mts., 1 ♂, vi (CM); Gavilan Peak, nr. Lake Matthews, 2 ♂, iv (KH); Idyllwild, 5 ♂ 4 ♀, vii (YU, CIS); Lee Lake, 7 ♂ 3 ♀, v, vi (CAS, LACM); Palm Springs, 1 ♂, iv (UCD); near Palm Springs, 1 ♂ 1 ♀, iii (LACM); Palms to Pines Hwy., E slope San Jacinto Mts., 3000', 3 ♂, iv (JL); Perris, 4 ♂ 1 ♀, vi, vii (LACM); Pinyon Crest, 12 rd. mi. SW Palm Desert, 1 ♂, iv (CIS); 1 mi. E Pinyon Flat, 1 ♀, vii (CIS); 3 mi. E Pinyon Flat, Santa Rosa Mts., 1 ♂, v (CIS); 4 mi. E Pinyon Flat, 4 ♂ 1 ♀, iv (CIS); Railroad Canyon, 3 ♂ 1 ♀, v (LACM); hills 3 mi. SW Redlands, 1 ♂, iv (CIS); Riverside, 3 ♂ 3 ♀, iv-vi (LACM, CAS, CM); 5 mi. W Sage, 4 ♂ 5 ♀, vii (CIS); San Jacinto Mt., 1 ♂ 3 ♀, vi, vii (LACM); Santa Ana Mts., 1 ♂, vi (DB); Snow Creek, 3 ♂ 1 ♀, v (CAS, LACM); 1-2 mi. S Temecula, 13 ♂ 10 ♀, vii (CIS). *San Benito Co.*: 12 mi. S Paicines, 3 ♂ 4 ♀, vi (CIS, CAS, LACM); Pinnacles Nat. Mon., 1 ♂ 1 ♀, v (KH); 4 mi. E Pinnacles Nat. Mon., 5 ♂ 6 ♀, vi (CIS, CAS, LACM); 3 mi. S Tres Pinos, 4 ♂ 1 ♀, vi (CIS, CAS, LACM). *San Bernardino Co.*: Alta Loma, 1 ♂ 1 ♀, vii (AM); Baldy Mesa, nr. Cajon Pass, 5 ♂ 1 ♀, vi (LACM); Barton Flats, 1 ♂, vi (CAS); Bowen Ranch Rd., Ord Mts., SE Hesperia, 4 ♂ 2 ♀, v (GG); Burns Spring, 10 air mi. NE Yucca Valley, long series, v (JL); Cactus Flats, 6000', San Bernardino Mts., 2 ♂ 3 ♀, vii (MCZ); Cajon Pass, 2 ♂ 3 ♀, vi (JL); Camp

Baldy, 1♂, vii (MCZ); 4 mi. SE Devora, 5♂ 1♀, vi (CIS); 9 mi. N Fontana, 1♂, vi (CIS); Granite Mts., nr. Apple Valley, 3♂ 1♀, iv, v (KH); Lucerne Valley, 4♂ 20♀, v (LACM, CM); Hwy. 38 below Marton Pk., 3300', San Bernardino Nat. For., 39♂ 23♀, vii (AM); Morongo, 2♂, v (LACM); Oak Glen, 1♀, vii (CAS); Phelan, 2♂, vi (LACM); 12 mi. ENE Redlands, 3200', 2♂, vi (AM); 16 mi. E Redlands, 1♂ 3♀, vii (GG); Santa Ana Cyn., nr. San Andreas Fault, 3♂, vi (GG); Santa Ana River, 5000', 1♀, vii (AM); 1 mi. SE Sheephole Summit, Sheephole Mts., 2♂ 1♀, iii, iv (CIS, JL); Victorville, 1♂, v (LACM). *San Diego Co.:* Alpine, 1♂ 1♀, vii (CM); 6 mi. E Banner, 3♂ 5♀, vi (CIS); 2 mi. W Barrett Dam, 1♂, vii (CIS); Bedford Canyon, 1♂, vi (CIS); Black Mtn., 2♂ 2♀, vi (CIS, KH); 2 mi. SE Bonita, 1♂ 2♀, vi (CIS); Box Canyon, 1♂, v (CAS); Buckman Spr., 3♂ 1♀, v, vi (CIS); Calavo Gardens, La Mesa, 19♂, 5♀, v, vi (AM); nr. Camp Ole, Mt. Laguna, 9♂ 15♀, vii (AM, CIS); Cardiff, 1♂, vi (CIS); Challas Hts., 5♂ 2♀, iv (CM); Crest, nr. El Cajon, 5♂ 5♀, vi (GG); Cuyamaca, 1♂, vii (KH); Del Mar, 1♂ 1♀, vi (KH); 1 mi. S Del Mar, 8♂ 18♀, vii (CIS); Dictionary Hill, 1♂, vi (AM); El Cajon, 26♂ 4♀, iv-vi (AM, LACM, GG, YU); Fairmont Cyn., 4♂ 2♀, v, vi (CIS); 4 mi. E Fallbrook, 1♂ 3♀, vii (CIS); Garnet Peak, 5400', Laguna Mts., 3♀, vi (AM); Harbison Cyn., 1♀, vi (CIS); 3 mi. NW Henshaw Dam, 8♂ 9♀, vii (CIS); 5-8 mi. NE Jamul, 2♂ 2♀, vi (CIS); 1 mi. W Julian, 1♀, vii (CIS); Jct. St. Hwy. 76-78, 1♀, vi (KH); Kearney Mesa, 1♂, vi (CM); 2-4 mi. N Laguna Jct., 6♂ 4♀, v, vi (AM, CIS); Laguna Mts., 2♂, v, vi (KH, LACM); La Jolla, 11♂ 11♀, vi (CIS); Lakeside, 2♀, v, vi (CIS); 2 mi. NE Lakeside, 1♂ 1♀, vi (CIS); La Mesa, 3♂ 1♀, iv, v (CAS, LACM); 1 mi. E Lyons Pk., 4♂ 6♀, vii (CIS); Mason Valley, 6♂ 1♀, iv, v (LACM); Mission Dam, 1♂ 2♀, vi (CIS); Mission Gorge, 10♂ 7♀, vi, vii (KH, PO, CIS); Monument Pk., 1♂, vi (CIS); Mt. Helix, 5♂, v, vii (CIS, CAS); Mt. Laguna, 18♂ 15♀, vi, vii (CIS); Mt. Laguna Jct., 6♂, v (CIS); Mt. Palomar, 8♂ 3♀, vi, vii (CIS); Mt. Soledad, La Jolla, 2♂ 2♀, vi (CIS); 3 mi. NE Poway, 2♂ 1♀, vi (CIS); Powderhouse Cyn., 1♂ 1♀, v (CIS); "S" Mtn., 1♂, v (CIS); San Diego, 7♂ 6♀, v-vii (CM, CIS, LACM); 2 mi. SW Santa Ysabel, 1♂, vii (CIS); Santee, 1♂, vi (KH); Sentenac Cyn., 1♂, iii (UI); Solano Beach, 25♂ 19♀, vi (AM, CIS, UCD); Sorrento Beach, 2♂ 8♀, vii (AM, CIS); Sunnyside, 1♀, vii (CIS); Tecate Mtn., 14♂ 6♀, vi (KH, PO, CIS); Thing

Valley, 1♀, vii (CIS); Warners Hot Springs, 1♂ 4♀, vi, ix (CM); Witch Creek, 2♂ 2♀, vi (CM). *San Luis Obispo Co.*: 6 mi. S Creston, 1♀, vi (CIS); nr. Pozo, 1♂, vi (KH); 5 mi. E Sta. Margarita, 1♀, vi (CIS). *Santa Barbara Co.*: 1 mi. S Buellton, 9♂ 7♀, v, vi (CIS); Green Cyn., 8 air mi. W New Cuyama, 1♂ 1♀, v (CIS); Mission Cyn., Santa Barbara, 4♂ 1♀, v (AM); 6 mi. NW New Cuyama, 15♂ 5♀, v (CIS); 2 mi. E Solvang, 1♀, vi (CIS); 10 mi. E Twitchell Dam, Cuyama River Cyn., 1♂ 1♀, v (CIS). *Stanislaus Co.*: 7 mi. E Frank Raines Park, Del Puerto Cyn., 1♂, v (J. Mori Coll.) *Ventura Co.*: Circle X Ranch, B. S. A. Camp, 1500', 3♂ 1♀, iv (CIS); 1 mi. W jct. Frazier Park Rd. & U.S. 99, 3♂ 4♀, vi (KH). *County undetermined*: Fairview, 1♂ 3♀, v (CAS); Fredalba, 1♂, vii (CM); Nellie, 23♂ 13♀, vii, viii (CM); Ridge Route, Sierra Madre Mts., 1♂ 1♀, vi (LACM). *NEVADA*: *Churchill Co.*: 7 mi. W Frenchman, 4♂ 5♀, vi (JS); N end Sand Springs Mts., 4♂ 1♀, vi (DB); S end, Stillwater Mts., 5 mi. W Frenchman, 4000', 11♂ 4♀, v, vi (DB). *MEXICO*: *BAJA CALIFORNIA DEL NORTE*: Arroyo Seco, Sierra San Pedro Martir, 1♂, v (CAS); 6 mi. NE Arroyo Seco, 1♂, v (CIS); 12 mi. S Ensenada, 1♂, v (CAS); Laguna Hansen, 1♀, vii (LACM); 4 mi. SW La Zapopita, Valle de Trinidad, 1♂, iv (LACM); 9 mi. W Mike's Sky Ranch, Sierra San Pedro Martir, 2800', 3♂, v (RH); 20 mi. W Mike's Sky Ranch, Sierra San Pedro Martir, 1800', 3♂, v (RH); 2 mi. W Rancho El Ciprer, Sierra San Pedro Martir, 1800', 5♂ 3♀, iv (RH); 2 mi. E San Telmo, Sierra San Pedro Martir, 1000', 4♂, iv (RH); 2 mi. W Socorro, Sierra San Pedro Martir, 3000', 4♂, v, vi (CIS, CAS).

HOSTS: *Eriogonum fasciculatum* Benth. var. *polifolium* (Benth. in DC.) Torr. & Gray. *CALIFORNIA*: *Los Angeles Co.*: Pearblossom, 3♂, v (GG), adult assoc. (*Shields #184*); 1.1 rd. mi. E jct. Pine Cyn. Rd. & Ridge Route Rd., just NE Sandberg, 2♂ 3♀, vi (AM), adult assoc. (*Shields #94*). *Eriogonum fasciculatum* Benth. in DC. var. *foliolosum* (Nutt.) S. Stokes ex Abrams. *CALIFORNIA*: *Fresno Co.*: Parkfield Grade Rd., 4.5 mi. S Hwy. 198, 1♀, v (AM), adult assoc. (*Shields #85*). *Santa Barbara Co.*: 1 mi. W La Cumbra Lookout, E of San Marcos Pass, Santa Ynez Mts., 1♂, vi (AM), adult assoc. (*Shields #97*). *Eriogonum heermannii* Dur. & Hilg. var. *humilius* (S. Stokes) Reveal. *NEVADA*: *Churchill Co.*: 7 mi. W Frenchman, 4♂ 5♀, vi (JS), adult assoc. (*Shields #173 & 199*). *Eriogonum heermannii* Dur. & Hilg. var. *floccosum* Munz & Johnst. *CALI-*

FORNIA: *San Bernardino Co.:* large canyon just SE of Clark Mtn. Pk., Clark Mtn., 5 rd. mi. NW Mountain Pass, 2♂, ix (AM), adult assoc. (*Shields #175*). *Eriogonum heermannii* Dur. & Hilg. var. *sulcatum* (S. Wats.) Munz & Reveal in Munz. **CALIFORNIA:** *San Bernardino Co.:* Bonanza King Mine Canyon, E side Providence Mts., 1♂, ix (AM), adult assoc. (*Shields #179*).

Ssp. *bernardino* is on wing from mid March to early August (there are several September records), although not continuously so at any one locality.

Females of *bernardino* from Pallatt Creek, Los Angeles Co., and Tuttle Creek, Inyo Co., have extensive blue on the upper-side (as do *enoptes langstoni* near Lone Pine). A short series from Big Pine, Inyo Co., are very light in color. Material from Solano Beach, San Diego Co., shows a slight tendency toward *allyni*. One *bernardino* male (gen. det.) from Chino Canyon, Riverside Co., in April is remarkably like *enoptes dammersi* on the underside, which flies at this same locality in September and October. The rare September form from the eastern Mojave Desert on *E. heermannii* varieties appears nearest *S. battooides ellisiae*.

Ssp. *bernardino* is found in association with *Eriogonum fasciculatum* var. *foliolosum* at Arroyo Seco, Monterey Co.; Sage and Temecula, Riverside Co.; Paicines, Pinnacles, and Tres Pinos, San Benito Co.; Bonita, Camp Ole, Fallbrook, Henshaw Dam, Jamul, Lakeside, and Mt. Palomar, San Diego Co.; Buellton, Green Canyon, New Cuyama, and Twitchell Dam, Santa Barbara Co.; and Circle X Ranch, Ventura Co. (Langston records). Var. *foliolosum* is found in low mountains in southwestern California and northern Baja California.

Ssp. *bernardino* is also reported for *E. fasciculatum* var. *flavoviride* at 1 mi. W Cottonwood Spring, Joshua Tree Nat'l Mon., Riverside Co. (Langston records). Var. *flavoviride* extends along the northwest margins of the Colorado Desert and adjacent parts of the Mojave Desert, southeastern California.

Eriogonum heermannii var. *humilius* is found in Inyo and Mono cos., California northward and eastward to Humboldt and Nye cos., Nevada, flowering from June to October (see Reveal, 1970). Var. *floccosum* occurs in the eastern Mojave Desert in Little San Bernardino, Providence, and Clark Mts., San Bernardino Co., and in southern Clark Co., Nevada, flowering from August to October. Var. *sulcatum* ranges in Inyo and San Bernardino cos., California, eastward across Clark and southern

Nye cos., Nevada into Washington Co., Utah, and in northern Mohave and Coconino cos., Arizona, flowering from July to September.

Shijimiaeoides battoides martini (Mattoni, 1954)

Mattoni. 1954. *Bull. S. Calif. Acad. Sci.* 1954, vol. 53, pp. 157-160 & 164, pl. 43, ff. 3-4.

The holotype male was described from Oatman, Mohave Co., Arizona, IV-17-48 (R. H. T. & D. Mattoni), along with the allotype female and 27 paratypes. The male genital valve indicates that *martini* is a subspecies of *battoides*, according to Mattoni (1954). He found it at Oatman in close association with *E. fasciculatum* var. *polifolium*. It is distinguished from all other subspecies of *battoides* by a combination of light blue cyanic overlay, light grey underside, very wide auroral band, and small macules (?), according to Mattoni (1954). The closest relative of *martini* appears to be *bernardino*, which also uses *E. fasciculatum* (see discussion). Mattoni (1954) gives some distribution records and figures the upper surface of the male holotype and lower surface of the female allotype, in black-and-white (see also Emmel & Emmel, 1973, pl. 8, figs. 4-6).

DISTRIBUTION (viewed 25 ♂ gen. from 14 localities): ARIZONA: Mohave Co.: Goldroads, 1 ♂ 3 ♀, v (AM); Kingman, 4 ♂ 1 ♀, iv (DB); Oatman, 24 ♂ 8 ♀, iv, v (AM, LACM, KH, CAS). Pima Co.: between Quijotoa and Sells, 1 ♀, v (LACM). Yavapai Co.: Black Canyon, nr. Bumble Bee, 2 ♂, iii (DB); Hwy. 69, 4 mi. N Canyon, 2600', 11 ♂ 20 ♀, iv (CIS, CAS, LACM); nr. Rock Springs, 4 ♂ 6 ♀, iv (DB, CIS); Hwy. 69 (now I-17), 4 mi. N Rock Springs, 2 ♂ 5 ♀, iv (KR); Hwy. 79, 2 mi. N Rock Springs, 17 ♂ 13 ♀, iv (KR). CALIFORNIA: Inyo Co.: Argus Mts., 4 ♂, v (YU); Homewood Canyon, 3500', Argus Range, 1 ♂, vi (MCZ). San Bernardino Co.: Bonanza King, Providence Mts., 3 ♂, iv (LACM); Bonanza King Mine, 1 ♂ 1 ♀, iv (PO); 2 mi. N Bonanza King Mine, Providence Mts., 1 ♂, iv (PO); Clark Mts., 1 ♂ 1 ♀, iv (LACM); Gilroy Canyon, Providence Mts., 9 ♂ 6 ♀, iv (KH); wash below Gilroy Cyn., 5 ♂ 6 ♀, iv (JL); Sunflower Wash, 3200', Old Woman Mts., 11 ♂, iv (CIS, LACM). NEVADA: Nye Co.: Amargosa Desert, 6 mi. W Beatty, 3 ♂, v (DB).

HOST: *Eriogonum fasciculatum* Benth. var. *polifolium* (Benth. in DC.) Torr. & Gray. CALIFORNIA: San Bernardino Co.: canyon 3/4 air mi. SE Horse Thief Springs, 4400-4700',

Kingston Range, 11♂, vi (AM), adult assoc. (*Shields* #2). NEVADA: *Nye Co.*: 3 mi. SW Beatty, 5♂ 1♀, v (AM), adult assoc. (*Shields* #79). See Map 10.

Ssp. martini is on wing from late March to late June.

Specimens from the vicinity of Beatty, Nevada, appear to be intermediate between *martini* and *bernardino*. Also, both *martini* and *bernardino* occur in the Argus Mts., California, (although not typical *martini*). The specimen from between Quijotoa and Sells, Pima Co., Arizona, is large, with a partial red band on the underside of the primaries, but is otherwise like *martini*.

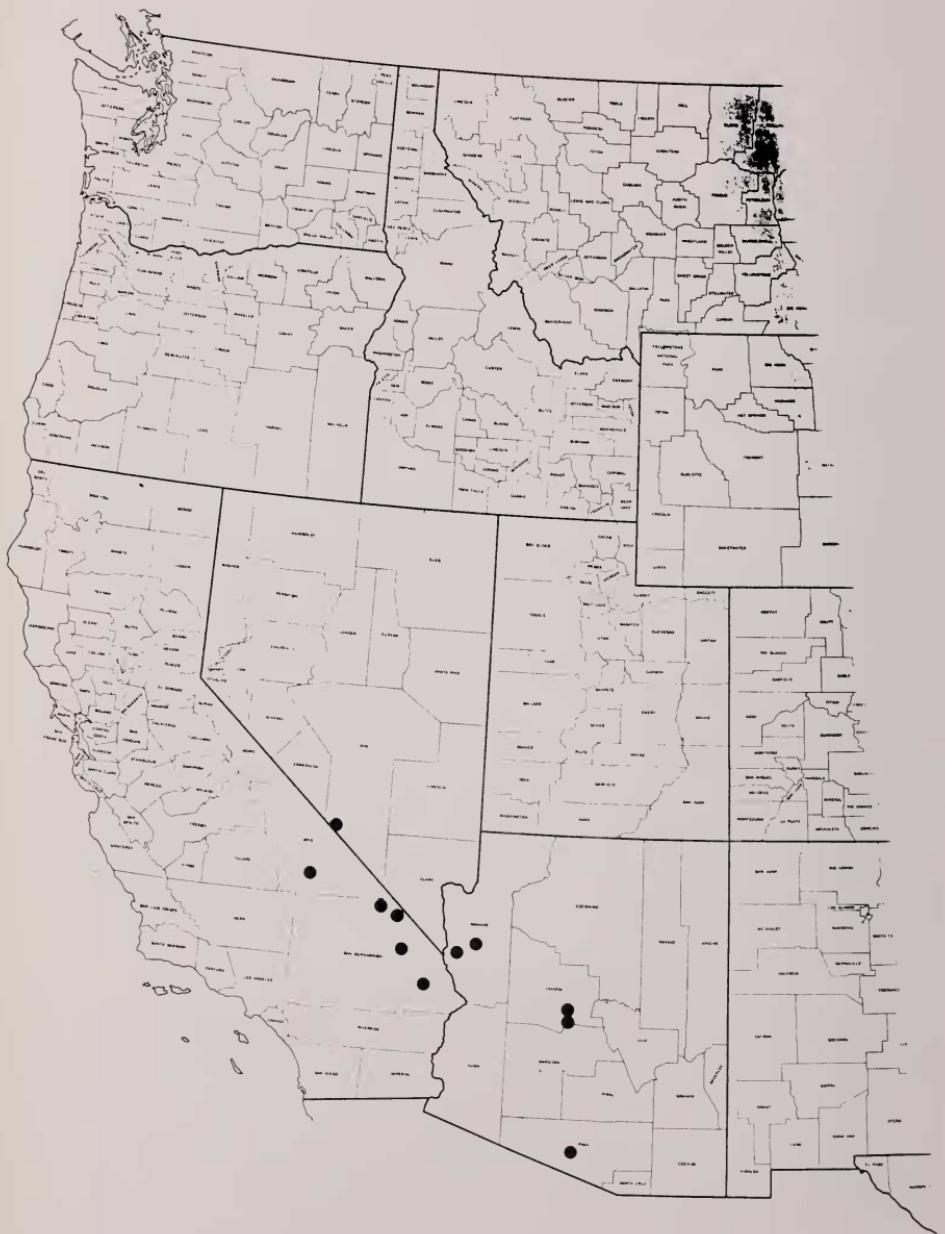
In the Providence Mts. and at Clark Mtn., San Bernardino Co., *martini* flies in late April, while an unnamed form about the size of *bernardino*, that is perhaps best described as near *ellisii*, associated with two varieties of *Eriogonum heermannii*, is found there in September. This latter form also occurs at Kingston Canyon, Toiyabe Range, Lander Co., Nevada, VII-22 & 23-64, one male (LACM). In the Stillwater Mts., Churchill Co., Nevada, in June, specimens resemble both *bernardino* and this small form near *ellisii*, and use a third variety of *E. heermannii* (see *bernardino* records).

Material from the Old Woman Mts. is clearly *martini*, while a short series from the Sheephole Mts. (both in San Bernardino Co.), some 40 miles to the southwest, is *bernardino*.

Although *bernardino* is sometimes reported associated with *E. fasciculatum* var. *polifolium*, as at Pinyon Crest, Riverside Co., and at Mt. Laguna and 6 mi. E Banner, San Diego Co. (Langston records), *martini* is exclusively on this variety. Var. *polifolium* ranges on the deserts of southern California and northern Baja California, southern Nevada, southwestern Utah, and western Arizona.

DISTRIBUTION SUMMARY

Subspecies of each *Shijimiaeoides*' species are mostly allopatric, as are their host *Eriogonum* species. Some, like *ancilla*, *glaucum*, and *enoptes enoptes*, have a wide range both in elevation and latitude. Others are narrowly restricted to certain plant communities or habitats: *spaldingi* in ponderosa and pinyon-juniper habitats; *bernardino* and *dammersi* to chaparral (and desert); *emmeli* and *ellisii* to the Colorado Plateau; *pallescens* to the Great Basin; *battroides battroides* to high elevations in the Sierra Nevada; *pallescens* and *emmeli* in sandy desert; and *allyni*, *smithi*, and *bayensis* to the seacoast.



Map 10.—Distribution of *S. battooides martini*.

Several "ring", or Rassenkreis, distributions (involving a number of allopatric subspecies of a polytypic species) suggest themselves (although no breeding or genetic evidence is available as yet):

I.

*rita emmeli**rita coloradensis**rita rita*

II.

*enoptes bayensis**enoptes columbae**enoptes enoptes**"rita" spaldingi**enoptes ancilla**enoptes langstoni*

Utah & W. Colo. small

*enoptes ancilla**enoptes mojave*

These rings of related subspecies could be due to re-contact with the parent population from range expansion and subsequent hybridization and suggest that these are still subspecies that have not as yet attained the reproductive isolation of a species.

There are some striking disjunctions within *Shijimiaeoides*. For example, *S. battoides comstocki* is known only from Tehachapi, Kern Co., California, and Park City, Summit Co., Utah. *S. battoides centralis* occurs in northern New Mexico and southern Colorado, with two outlying populations in Modoc Co., California. *S. battoides allynii* is found in the Los Angeles coastal region and on Cedros Island off Baja California. *S. battoides glaucon* occurs in the Northwest from northeastern California, northwestern (and extreme northeastern) Nevada, eastern Oregon, eastern Washington, Idaho, extreme southern British Columbia, and Sula, Montana, with one relict population on the Uncompahgre Plateau in western Colorado. These disjunctions may mean there was a previously wide distribution in the past, with the intervening populations gone due to environmental extinction or competitive displacement.

Two subgenera of *Eriogonum* (*Eucycla* and *Oligogonum*) are widely used by *Shijimiaeoides* and no doubt harbour new, undescribed subspecies. *Eucycla* is common and widespread throughout most of the trans-Mississippi West, from northern Mexico northward into the Great Plains, westward to Baja California, Mexico, and the west coast of the United States (including the islands adjacent to the coast) to southwestern Canada. *Oligogonum* occurs in western United States from northern Mexico into western and northern Texas, westward to Califor-

nia, and northward to southwestern Canada, with outlying populations in east-central Alaska and in Virginia and West Virginia.

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ADDENDA AND ERRATA

Several additional, relevant works have only lately come to my attention. Hemming (1931) recognized three subspecies of *Shijimiaeoides divina*: (a) *d. divina* Fixs. (Seoul, Pungking, and Heijo in Korea; July); (b) *barine* Leech (Oiwake, Hokkaido; June-July; Nambu, Honshu); and (c) *asonis* Mats. (Mt. Aso, Kyushu; August).

Waterhouse (1903, p. 211-212) described a small rare blue, *Zizera delospila*, and in 1938 erected a separate genus, *Zetona*, for it. In certain particulars, e.g. small size, wing shape, checkered fringe, white underside, extent of purplish on the upper-side, brown females, etc. it closely approaches *Zizeeria speciosa*, though I reserve judgement on their exact affinity until a detailed morphologic and genitalic comparison can be made. *Zetona delospila* is very rare and flies in June at King's Sound, Queen's Islet, and the Ord River, northwestern Australia. "The adults fly close to the ground in open areas amongst grass and low shrubs" (Common & Waterhouse, 1972).

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Unfortunately in Part IV, figures 29-33 were wrongly numbered. For the captions to be correct, change:

29	to	33
30	to	32
31	to	30
32	to	31
33	to	29

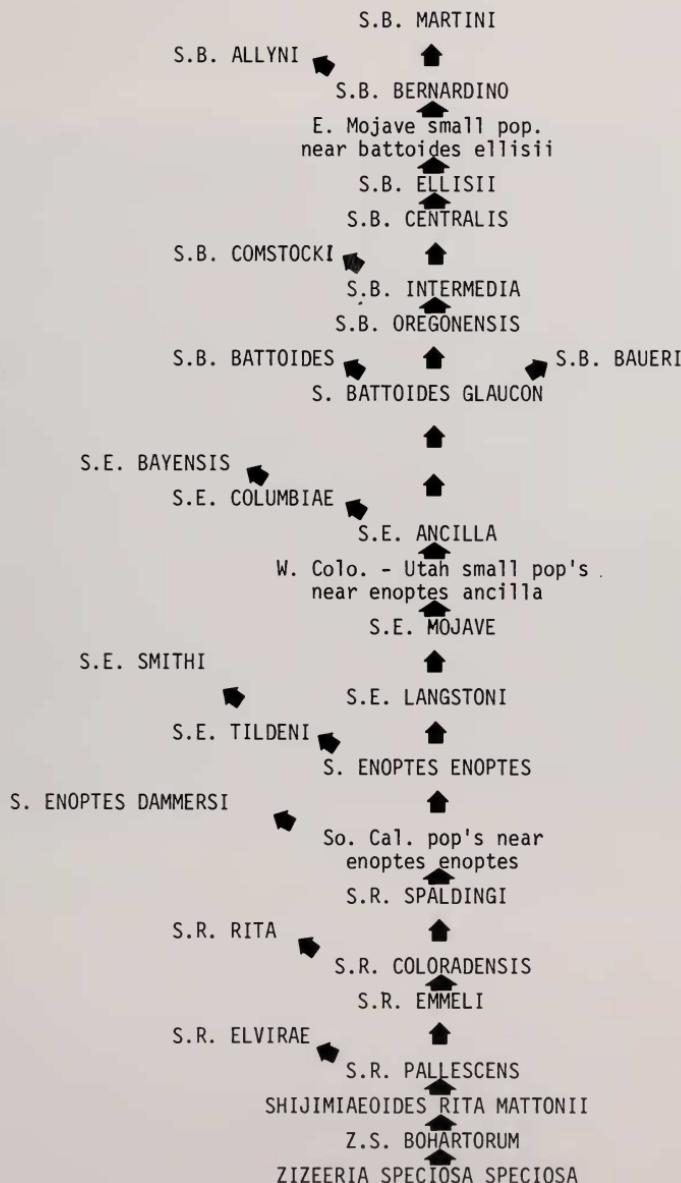


Fig. 31.—Schematic representation of the possible evolutionary development of the Nearctic *Shijimiaeoides* subspecies, based on comparative adult morphology and host *Eriogonum* classification.



Fig. 32.—*S. enoptes ancilla* X *S. battoides glaucon* ♂, possible hybrid, 8 mi. N of Jarbridge, Elko Co., Nev., VI-28-67, leg. J. Lane. Note the intermediate aspect of the valve cucullus. SEM photo, 60X, courtesy R. O. Schuster.

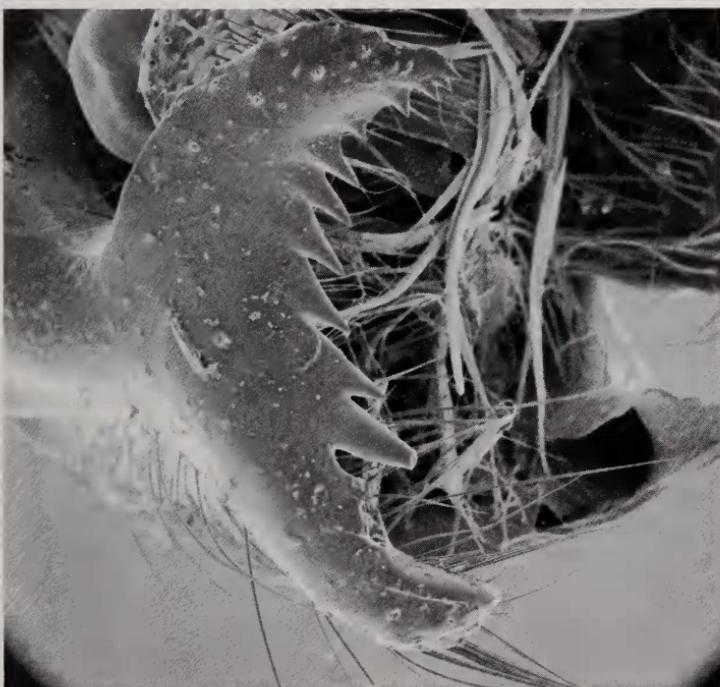


Fig. 33.—Same, showing the teeth regularly arranged and the valve strongly curved though not as bifurcate as in *battoides*. SEM photo, 120X, courtesy R. O. Schuster.



Fig. 34.—*S. enoptes ancilla* X *S. battooides glaucon* ♂ hybrid, Pattee Canyon, 3500', Missoula Co., Montana, VI-23-62, leg. J. Scott. The left valve seen here has a *battooides* aspect though not strongly bifurcate. SEM photo, 58X, courtesy R. O. Schuster.